TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 3.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

ALBERT (August). **Neue Arsenpräparate zur Bekämpfung protozoischer Parasiten, insbesondere der Spirochäten.** [New Arsenical Compounds to combat Protozoal Parasites, and especially Spirochaetes.]—*Klin. Woch.* 1924. Nov. 25. Vol. 3. No. 48. pp. 2184–2185.

KALBERLAH (Fritz). **Zur Chemotherapie der Spirochätosen und Trypanosomiasen (Präparat "Albert 102").** [Chemotherapy of Spirochaetosis and Trypanosomiasis ("Albert 102").]—*Ibid.* pp. 2185–2189. [1 ref.]

The papers give a detailed account of the therapeutic action of a chemical known as "Albert 102." It is an organic arsenic compound which has a very stable molecule, and, like neosalvarsan, contains 20 per cent. of arsenic in place of the 34 per cent. of the old salvarsan. The drug has been tested on 400 rabbits and over 4,000 rats and mice, which were either healthy or suffering from rabbit syphilis, trypanosomiasis or relapsing fever. Over 2,000 injections have been made in human beings in the treatment of general paralysis, tabes, cerebral syphilis and multiple sclerosis. The outcome of the animal experiments is that the author finds the drug a very efficient remedy. The tolerated doses in grams per kilo. of body weight of "Albert 102," old salvarsan and neosalvarsan in mice are respectively 0·08–01, 0·18 and 0·37; the respective curative doses for *Trypanosoma equiperdum* infections are 0·005–0·006, 0·02 and 0·04; for relapsing fever 0·02–0·025, 0·0625, and 0·165. In rabbits the tolerated doses are 0·04–0·045, 0·1 and 0·225; the curative doses for these animals suffering from experimental rabbit syphilis are 0·0015–0·003, 0·01, and 0.02. It thus appears that the curative doses of "Albert 102" are considerably below those of salvarsan and neosalvarsan. In the treatment of the human diseases mentioned above intravenous injections of 0·05 gram. were first given. The dose was gradually increased up to 0·1 gram. and in certain cases of general paralysis up to 0·2 gram. As regards the number of doses it is stated that at least 25 must be given in cases of multiple sclerosis, while in general paralysis, chiefly with a view to estimating the tolerance, as many as 60 or 70 and in one case 150 injections have been made.

C. M. Wenyon.

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i. Pons (R.). **Action *in vitro* du 914 sur des spirochètes en culture.**—*C. R. Soc. Biol.* 1924. Oct. 31. Vol. 91. No. 30. pp. 938–941. With 1 fig. [2 refs.]

ii. Pons (R.). **Action *in vitro* sur des spirochètes en culture, du sang, de l'urine et des organes d'un lapin novarsénié.**—*Ibid.* pp. 941–942.

i. As a result of numerous recorded observations it has been accepted that the organic arsenic compounds such as 914 have no action on spirochaetes *in vitro*. The author points out that in these experiments the time of observation has been limited by reason of the fact that spirochaetes commence to degenerate after five hours in pure defibrinated blood alone. To him it has always appeared possible that if observation had been continued longer some action of added drugs might have been seen. Having a well established culture, isolated from a type of recurrent fever, of a spirochaete to which he gave the name *Spirochaeta sinensis*, he tested the effect of the addition of varying quantities of 914 to the *culture media*, every care being taken to eliminate alteration in the reaction of the medium.

During the first ten hours, even with 1-100 concentration of the drug, no change occurred in the spirochaetes; towards the 15th hour, however, there appeared to be a marked reduction in their number, and a loss of motility; eventually all were destroyed and the culture was sterilized. The time required for complete sterilization varied with the concentration of the drug. Similar tests were made with cultures of *Bacillus coli* and Shiga's bacillus. In a comparative test it was found that 914 sterilized the bacteria cultures more rapidly (8 to 10 hours) than the spirochaete cultures (20–24 hours). The maximum dilution capable of killing the spirochaetes was, however, 1-200,000, as compared with 1-2,500 for *B. coli*, and 1-7,500 for Shiga's bacillus. The negative period which occurs before any action becomes apparent varies with the concentration of the drug. If the drug is first allowed to act upon blood or organ extracts there is a definite but slight activation, in that cultures of spirochaetes are killed in a slightly shorter time. [The name *Spirochaeta sinensis* was first proposed in the paper reviewed in this *Bulletin*, Vol. 21, p. 471, but was not, however, mentioned in the review.]

ii. This paper is a continuation of the preceding one and describes experiments designed to test the action of the blood and organs of rabbits dosed with 914 on the cultures of the spirochaete. A rabbit weighing 2 kilos was given 12 cgm. of 914 intravenously, and at intervals during the next 72 hours, 5 cc. of blood was drawn from the heart. The blood was added to 7 cc. of culture medium which was immediately inoculated with 10 drops of a rich spirochaete culture. Similar control experiments were made with a normal rabbit. In the case of the blood withdrawn at the 3rd hour after the injection of the drug all spirochaetes had disappeared in 35–40 hours, while in the control tube they were still living. Blood taken before and after the 3rd hour took a longer time to sterilize the culture. At 72 hours the blood had no action on the culture and behaved like the blood of the normal rabbit.

In another test the plasma was separated from the corpuscles, which were washed. The plasma alone had spirochaeticidal properties. Similar tests made with emulsions of the organs showed that the kidney tissue alone was active. The urine was strongly spirochaeticidal.

C. M. W.

KAMEI (Kasumasa). **[On the Easy Method of Demonstration of Spirochetes in the Blood. An Experimental Study with** *Spirocheta morsus muris* **et** *Spirocheta icterohemorrhagica.*]—*Chugwai Iji-Shimpo* (*Central Med. Jl.*). 1924. June. Vol. 43. No. 11. [Summarized in *Japan Med. World.* 1924. Sept. 15. Vol. 4. No. 9. p. 237.]

The blood is centrifuged in hand machine till the cells have deposited. The fluid layer is then centrifuged in an electrically driven instrument at 3,000 revolutions per minute. The sediment is examined for spirochaetes.

C. M. W.

GOUZIEN (Paul). **La fièvre récurrente à spirochète d'Obermeier. Rapport sur l'enquête effectuée conformément à la décision du Comité de l'Office International d'Hygiène publique en mai 1923.**—*Bull. Office Internat. d' Hyg. Publique.* 1924. June. Vol. 16. No. 6. pp. 731–780. [2 refs.]

The Committee of the International Office of Hygiene circulated a questionnaire with the object of obtaining information regarding relapsing fever in various parts of the world. The replies received form the basis of this comprehensive article, which gives a very good résumé of recent observations on the disease in all its aspects. From the practical point of view of sanitation it is convenient to consider the disease as of two types, viz., louse-borne and tick-borne. It is the former which is discussed at length in the report. The louse-borne disease is cosmopolitan and calls for the same international measures of control as have been recommended for typhus fever. In view of the possibility of hereditary transmission of the relapsing fever virus from louse to louse these will have to be even more stringent. From the information received there arise several points which require further discussion.

1. Would it be advantageous to replace the old name recurrent fever employed for the pyrexia caused by the spirochaete of Obermeier by a new one ?
2. Should the period of quarantine be 12 days, the maximum incubation period of the disease ?
3. Information is required regarding the length of time during which individuals once infected remain carriers of the infective organism.
4. If it is decided that measures of control similar to those employed against typhus ought to be adopted, what actually should these measures be ?

C. M. W.

WERNER (Joh.). **Einige parasitologische Beobachtungen bei artifizieller Recurrensinfektion.** [Parasitological Observations on Induced Relapsing Fever.]—*Ztschr. f. Hyg. u. Infektionskr.* 1924. July 3. Vol. 103. No. 1. pp. 157–161. [4 refs.]

Having employed a strain of *S. duttoni* for therapeutic purposes the author has been able to obtain definite information regarding the incubation period and relapses of induced relapsing fever.

The incubation period in human beings inoculated from mice at the height of their infection was 7 days when the injection was sub-

cutaneous and 5 days when it was intravenous. Inoculating infective blood directly from man to man by the subcutaneous and intravenous routes, the incubation periods were 9 and 8 days respectively in the case of blood taken during the development of an attack, but 10 days if the blood was taken in the afebrile period. When mice were inoculated with blood taken from human beings at intervals during the afebrile period the incubation period was longest if the blood was taken on the first or second day. It decreased as the time of onset of the next attack approached. Inoculation of cerebrospinal fluid of human cases into mice produced infection in 8 days, though spirochaetes could not be demonstrated in the fluid.

In human beings the number of attacks varies from 2 to 7. On only one occasion has a relapse been noted in a mouse. The attacks last from 1 to 6 days, the first, as a rule, being the longest and associated with the highest temperature (40·6° C.). The interval between the first and second attacks is usually 5 or 6 days; between later ones it is 9 or 10 days. The longest interval was three weeks, which occurred between a 5th and 6th attack. Usually the blood remained infective to mice for 10 to 14 days after the last attack. On one occasion a reinfection was brought about one year after a previous one. Attempts to reinfect earlier than this failed.

An attempt was made to discover the survival time of spirochaetes in the blood and organs after death. The blood and organs, especially the brain, of a man who died during the height of a relapse and those of mice killed during the height of their infection were infective to mice for 96 and 120 hours after death. In the case of mice killed during the immune period following infection the brain alone is infective, and its infectivity lasts longer than that of the brain of a mouse killed during the height of the infection, an observation which suggests the presence of some resistant form of the spirochaete. Neither human beings nor mice acquired infection by the application of infective material to the uninjured skin. Mice, however, became infected when fed with bread soaked in infective blood. Intraperitoneal inoculation of mice with blood-free urine from cases at the height of infection did not produce infection.

C. M. W.

GUILLET. **Fièvre récurrente à tiques à Brazzaville.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Jan.–Feb.–Mar.–Apr. Vol. 22. No. 1. pp. 77–81. [2 refs.]

Towards the end of 1922 there appeared in the militia at Brazzaville a disease which, on account of the frequent occurrence of oedema and severe rachialgia, it was thought might be due to defective rations. It turned out to be tick fever, *Ornithodorus moubata* being discovered in large numbers. Some of the temperature charts showed only a single febrile period, others two with an interval of several days. The chief symptoms noted were severe headache and rachialgia which fixed the neck, jaundice, sometimes most persistent, and enlargement of the liver and spleen. Oedema of a hard type commonly occurred, about the shoulders, the arms, and the legs in the popliteal area and the calves. After the disease had been identified by discovery of the spirochaete, treatment with novarsenobenzol reduced the period of invaliding to 15 days.

C. M. W.

MARSEEW. [**Zur Epidemiologie des Fleck- und Rückfallfiebers in der Ukraine, Ende 1922.**] [Epidemiology of Typhus and Relapsing Fever in the Ukraine, End of 1922.]—*Prophylaktische Medizin* (russisch). 1923. Year 2. No. 1–2. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 310.]

The epidemic of typhus and relapsing fever in the Ukraine was a most serious one. The prisons were especially affected, as many as 60 per cent. of the cases in Kieff being amongst prisoners; and the outbreaks of epidemics can often be traced back to the prisons. The attention of the sanitary authorities is called to these diseases, which show no signs of abating in spite of improvement in the food conditions of the population.

C. M. W.

KENYA MEDICAL JOURNAL. 1924. May. Vol. 1. No. 2. p. 54.—**The Further History of the Case of Relapsing Fever referred to in the** *Journal of the Kenya Medical Service,* **March, 1924.**

The note refers to a case of relapsing fever in Kenya colony which is remarkable in that between the date of the first attack on Nov. 11, 1923, and the end of March, 1924, there were 10 relapses which occurred in spite of treatment with N.A.B. In all 4·3 gm. were given, 2·0 gm. intravenously and 2·3 gm. intramuscularly. Iridocyclitis appeared on Feb. 10, but it yielded readily to treatment.

C. M. W.

WELCH (H. V.). **A Point of Interest in the Treatment of Relapsing Fever.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. p. 149.

A case of relapsing fever which had been treated with two doses (·6 gm.) of 914 administered in the apyrexial period. A third attack brought him into hospital. Spirochaetes were present in the blood when a mild injected condition of the eye with slight photophobia rapidly developed into a sharp attack of iritis. Four days after admission the patient's temperature began to rise and he was given a dose of ·9 gm. of 914. The attack was completely aborted, but the iritis became worse. Five days later ·6 gm. of 914 was given. The iritis cleared up in 12 hours. The case shows that though 914 should be given while the temperature is rising, it may be of value in the intervals for the treatment of symptoms.

C. M. W.

i. SHAH (Wilayat). **A Few Brief Notes on Relapsing Fever.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. pp. 148–149.

ii. WELCH (T. B.). **Treatment of Relapsing Fever.** [Correspondence.]—*Ibid.* Oct. No. 7. p. 216.

i. The author, who has treated 84 cases of tick fever in Kenya colony, has convinced himself by comparative observations that N.A.B. has no effect on the course of the disease, and that to administer it is waste of money. No other arsenical appears to have been tried.

ii. The note by SHAH reviewed above has reminded the author that he had experience of relapsing fever in the same district some years before. A dose of Galyl was given at the first relapse and another a week later. The author feels certain that a number at any rate of the cases were completely cured, though he admits that there may be certain strains resistant to N.A.B.

C M. W.

SULDEY (E. W.). **Diagnostic *post-mortem* de la fièvre récurrente par la ponction hépatique.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 475–476.

The author has found that spirochaetes of relapsing fever may be demonstrated in films of material obtained by puncturing the liver 12 to 20 hours after death. In certain instances, when it is important to exclude death from yellow fever and an autopsy is not possible, the simple operation of liver puncture may give the diagnosis.

C. M. W.

WAIL (S. S.). **Die pathologisch-anatomischen Veränderungen der Blutgefässe beim Typhus recurrens.** [Pathologico-Anatomic Changes in the Blood Vessels in Relapsing Fever.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1922. Vol. 240. No. 1/2. pp. 261–270. With 4 figs. [3 refs.]

In relapsing fever definite lesions of the walls of the blood vessels are a feature of the pathological changes. They are the result of alterations in the blood in the form of toxaemia and lipaemia. The endothelium injured by the poisonous substances in the blood becomes infiltrated with fat ; it desquamates and may fill the entire lumen of a vessel. This degeneration occurs throughout the body, but falls most heavily on the liver and spleen.

C. M. W.

JOHN (Emil). **Impfungen mit der *Spirochaeta Duttoni* bei multipler Sklerose.** [Treatment of Multiple Sclerosis by Inoculation with *S. duttoni*.]—*Med. Klin.* 1924. Nov. 16. Vol. 20. No. 46. pp. 1610–1612. [13 refs.]

As no statements appear to have been published regarding the relapsing fever treatment of multiple sclerosis the author describes his experience in the treatment of nine cases of the disease by this method. In the case of a disease like multiple sclerosis, in the natural course of which remissions are common, great care has to be exercised before any apparent benefit can be attributed to any line of treatment. The author finds that he cannot recommend the treatment of the disease by superimposed relapsing fever as the method of choice.

C. M. W.

BONNE (C.). **Recherches sur les spirochètes de la spirochétose fébrile de Sumatra.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 623–628. With 1 fig. [2 refs.]

During the last few years observers in Sumatra have isolated leptospira from a series of diseases (benign febrile conditions of short duration without or with jaundice ; severe febrile conditions with jaundice or with jaundice and haemoglobinuria) of various types resembling dengue, Weil's disease and blackwater fever. Whether the organisms from these various conditions are identical or not cannot as yet be stated, but VERVOORT has proposed the name *Spirochaeta febrilis* for the organism isolated from the mild disease. The author of the paper has investigated a strain of this organism

and compared it with strains of *L. icterohaemorrhagiae* from Paris and from Amsterdam. The strain of *S. febrilis* had been originally isolated by inoculation of blood of a case of five-days fever into a guineapig from the blood of which cultures were obtained.

In culture *S. febrilis* was found to be a typical leptospira and differed in no way from *L. icterohaemorrhagiae*, unless in the rapidity of its growth in artificial media. In guineapigs it produced the same lesions as the organism of Weil's disease. Differences were met in the serological reactions (agglutination, lysis and protection of animals). While the Amsterdam and Paris strains proved to be completely homologous, the Sumatra strain differed in that sera which would produce complete agglutination and lysis in the European strains acted less vigorously on the Sumatra strain. Similarly a dose of serum which would protect a guineapig against the European strains gave inconstant results with the Sumatra strain. In spite of the similarity of the morphological and cultural characters of these organisms it is concluded that serologically the Sumatra organism differs from the others investigated. [The name suggested for the spirochaete by VERVOORT was *Leptospira pyrogenes* and not *S. febrilis* (this *Bulletin*, Vol. 21, p. 262, and below).]

C. M. W.

VERVOORT (H.). **Dengue-like Fevers in the Tropics caused by Spirochaetes. Spirochaetosis Febrilis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress. Singapore*, 1923. pp. 683–697. With 5 figs. & 6 graphs. [14 refs.]

This paper appears to describe the same observations as those recorded in an earlier paper (this *Bulletin*, Vol. 21, p. 262). It may be noted that the organism isolated from fevers of short duration, some of which were typically dengue, appears to be a leptospira which the author names *Leptospira pyrogenes*. Inoculated into guineapigs it gives rise to infections, some of which are severe and resemble experimental Weil's disease.

In addition to this organism another has been seen. It is referred to as a coarse spirochaete. It has been cultivated in horse serum medium but always in association with bacteria. The possibility of its being a contamination is recognized, as it was found in the serum of 3 sick horses. It was also seen in the ascitic fluid from a rabbit and guineapig. It is evident that the origin of this organism requires further investigation.

C. M. W.

VAN DE VELDE (E.). I.—**Spirochaetaemia in Tropical Fevers.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress. Singapore* 1923. pp. 644–651. With 12 figs. [1 ref.]

——. II.—**Spirochaetosis Ictero-haemorrhagica (Weil's Disease) in the Dutch Indies.**—*Ibid.* pp. 652–682. With 5 charts.

The first of these papers contains an account of the method adopted by the author to demonstrate spirochaetes in the blood. Thin blood films were stained by a modified Fontana method. In all 360 cases of fever were examined and spirochaetes, always in very small numbers, were found in the blood of 23. Of these cases 9 had malaria and 2 typhoid, so that the spirochaetes were found in 12 cases of fever the

cause of which was not known. Two of these had definite symptoms of dengue. The description and illustrations of the spirochaetes are not very convincing. They do not show clearly the characters of leptospira. Some of them are coarse-looking organisms which in shape resemble forms commonly found in the intestine and might be considered as contaminations.

The second paper is a lengthy discussion on Weil's disease and experiments which were undertaken to prove that the disease occurs in the Dutch East Indies. There seems to be no doubt that typical cases do occur there, as indeed BAERMANN (this *Bulletin*, Vol. 21, p. 260) has already shown.

C. M. W.

i. KOSHINA (Yoshimori), SHIWOZAWA (Soichi) & KITAYAMA (Kichiro). [**On the Etiology of "Akiyami" Harvest Sickness or Seven-Day Fever.**]—*Tokyo Igakkwai Zasshi* (*Jl. of Tokyo Med. Soc.*). 1924. Apr. Vol. 38. No. 4. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 268].

ii. ——, —— & ——. [**On the Relation between Spirochetes of "Akiyami" (Autumnal Disease) and the Rat.**]—*Iji Shimbun* (*Med. News*). 1924. May. No. 1140. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 203.]

i. The authors isolated 12 strains of spirochaete from cases of "Akiyami" harvest sickness, a disease occurring endemically in a county of the Shizuoka Prefecture. They could group them as A strains of high virulence, and B strains of slight virulence. In many ways the B strains agreed with the spirochaete of seven-day fever, but the A strains were clearly different from the spirochaetes of epidemic jaundice, seven-day fever and the B group. The differences were best demonstrated by agglutination and Pfeiffer's reaction, much less so by active immunization experiments.

ii. Field mice collected in a district where the disease was prevalent were found to be passing in their urine organisms which corresponded, when inoculated into the rabbit, with the leptospira of strain A.

C. M. W.

DELAMARE (G.). **Quelques conditions de l'exploitation sémiotique des spirochétoses bronchiques et intestinales.**—*Progrès Méd.* 1924. Oct. 4. No. 40. pp. 585–587. [2 refs.]

This paper is a discussion of the vexed question of the significance of the spirochaetes found in the mouth, bronchi and intestine. It is pointed out that those of the bronchi and intestine resemble morphologically those of the mouth and are given different names from the situations in which they occur. After reviewing arguments on both sides the author favours the view that the saprophytic spiral organisms cf the mouth may occasionally assume pathogenic properties in different parts of the body. The multiplicity of symptoms ascribed to these infections renders the whole question a very complicated one; nevertheless, he believes that to regard the spirochaetes as sometimes pathogenic is better than ignoring their presence entirely. It has, however, constantly to be borne in mind that the presence

of a large number of these organisms may mask infections with tubercle bacilli, spirochaetes of syphilis, cholera vibrios and *Entamoeba histolytica*. A diagnosis of spirochaetosis can only be made with the utmost circumspection and by elimination. The elimination, of course, refers to known causes of disease, but the author would no doubt admit that every new cause discovered would eliminate a number of the spirochaetal cases, a process which might ultimately lead to their complete disappearance.

C. M. W.

GREER (Alvis E.). **Spirochetosis Bronchialis (Castellani): Case Report.**—*Southern Med. Jl.* 1924. July. Vol. 17. No. 7. pp. 469–473. With 4 text figs. [66 refs.]

A general discussion of the condition known as bronchial spirochaetosis and the report of a case of the disease in the United States, where it is said to be more prevalent than commonly thought. The case described was of a chronic nature with a history of two years' illness. Though tubercle bacilli were not found it is of interest to note that X-ray examination of the patient's right lung showed a greyish opacity ranging from the right hilus towards the apex but not infiltrating the apex itself. It is remarked that spirochaetal bronchitis may be complicated by pneumonia or tuberculosis. [Would it not have been more correct to regard these diseases as complicated by spirochaetal invasion ?] A series of drawings shows the morphology of the spirochaetes of Vincent's angina, the mouth and the bronchi. In connexion with the latter certain granular bodies, which are assumed to be granular phases of the spirochaetes, are shown.

C. M. W.

CASSAËT (E.), BONNIN (H.) & GUÉNARD. **Sur quelques particularités de la bronchite sanglante de Castellani.**—*Gaz. Hebd. des Sciences Méd. Bordeaux.* 1924. Apr. 13. Vol. 45. No. 15. pp. 226–228.

The paper describes in detail a case of bronchial spirochaetosis in a woman in France. There was a persistent cough which was most troublesome in the mornings. The sputum was small in quantity, liquid and marked with small streaks of blood. From time to time definite haemoptysis occurred. The patient came under treatment for recently acquired syphilis but the drugs administered did not affect the bronchial condition. A careful examination revealed no lung disease and tubercle bacilli were not discovered. On the other hand, spirochaetes of various types, fusiform bacilli and other bacteria were found in the sputum. Radioscopic examination of the lungs after the introduction of lipoidol into the bronchi by intra-laryngeal injection revealed no dilatation. Various treatments were adopted, but none of these brought about a disappearance of the organisms. It is thought that the association of the spirochaetes with the fusiform bacilli is a strong argument in favour of regarding these organisms as identical with the spirochaetes and fusiform bacilli (*S. vincenti* and *B. hastilis*) of Vincent's angina and other conditions.

C. M. W.

DELAMARE (G.). **Au sujet de l'indice d'identification morphologique des spirochètes bronchiques.**—*C. R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1002–1004. [3 refs.]

Reference is made to the verdict of PONS (this *Bulletin*, Vol. 21, p. 734) on DE MELLO's index for distinguishing spirochaetes, which consists in obtaining the mean length of 100 organisms and dividing this by the average number of coils. The author thinks that though DE MELLO's method may not be reliable, something may be done by taking into account the length and the maximum height of the spiral turns.

C. M. W.

BROUGHTON-ALCOCK (W.). **Intestinal Spirochaetosis.**—*Jl. State Med.* 1924. Aug. Vol. 32. No. 8. pp. 387–392.

In this paper the author attempts to revive the view that a definite disease, intestinal spirochaetosis, exists. He confines himself to two organisms, *Spirochaeta eurygyrata* and *S. stenogyrata*. Only the former is supposed to be pathogenic, its special habitat being mucus, in which it sometimes occurs in enormous numbers. It is well known that these organisms occur, as the author describes, in certain chronic affections of the intestinal tract associated with mucus production, but he brings forward no new evidence of their pathogenicity. Having seen them on many occasions in diseases, the cause of which is unknown, he singles out the spirochaetes, as others have done before him, from the bacteria and cocci which are invariably present, and which might equally well be the cause of the disturbance. It is presumably because the organisms are spirochaetes and as such are more conspicuous than the commonplace bacteria and cocci that attention is directed to them. Something more than a record of their presence, even in large numbers, is required before they can be regarded scientifically as pathogenic organisms.

C. M. W.

WALDORP (C. P.). **Spirochétose intestinale.**—*C. R. Soc. Biol.* 1924. July 4. Vol. 91. No. 23. pp. 322–323.

Three cases of intestinal derangement associated with the presence of spirochaetes in the faeces are recorded. In spite of the long duration of the illness (24 and 21 years) in two of the cases a complete cure with disappearance of the spirochaetes was brought about by the use of stovarsol in one and bismuth salicylate in the other. It is supposed that a condition of gastric insufficiency allowed the oral spirochaetes to invade the intestine. In a discussion following the reading of the paper C. E. PICO points out that no proof of the pathogenicity of these spirochaetes had been produced and that it was impossible to state that these organisms alone were present. He believes that the condition of enteritis favoured the growth of spirochaetes in the intestine.

C. M. W.

i. DELAMARE (G.). **Spirochétoses intestinales.**—*Ann. de Méd.* 1924. Apr. Vol. 15. No. 4. pp. 315–364. With 2 plates & 2 figs. [122 refs.]

ii. OLLIVIER (Jean). **Les spirochétoses intestinales.**—*Progrès Méd.* 1924. June 28. No. 26. pp. 407–408.

i. The article is a comprehensive review of the literature dealing with the subject of intestinal spirochaetosis in all its aspects. The views expressed are the same as those which find a place in other papers by the same author reviewed in this number of the *Bulletin*. This article, in that the various points are more fully dealt with and that it is accompanied by a lengthy bibliography, should become a work of reference for all who wish to study the subject with a view to obtaining precise information regarding the relations of the intestinal spirochaetes to other saprophytic forms and actual evidence of the possibility of their pathogenicity, which at present is merely based on the number of spirochaetes present in certain cases and the absence of any other cause which can be demonstrated by the usual diagnostic methods.

ii. A general account of intestinal spirochaetosis, stimulated by the article of DELAMARE (*see above*). The author believes that there is no doubt as to its being a clinical entity.

C. M. W.

BROTZU (Giuseppe). **Un caso di febbre ricorrente in Sardegna.**—*Policlinico.* Sez. Prat. 1923. Oct. 15. Vol. 30. No. 42. pp. 1353–1354. With 1 chart. [3 refs.]

MANTEUFEL (P.). **Die kulturelle Anreicherung von Rekurrensspirochäten als diagnostisches Hilfsmittel am Krankenbett.**—*Arb. a. d. Reichgsndhtsamt.* 1924. Vol. 54. No. 3. pp. 337–339.

RISQUEZ (J. R.). **Estudio de la eliminación de espiroquetes en un caso de bronco-espiroquetosis de Castellani.**—*Gac. Med. de Caracas.* 1923. Nov. 30. Vol. 30. No. 22. pp. 342–344.

RAT-BITE FEVER.

ROBERTSON (Andrew). **Observations on the Causal Organism of Rat-Bite Fever in Man.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 157–175. [132 refs.]

This paper describes investigations conducted on the causative organism of rat-bite fever isolated from a case in England. It was studied chiefly in mice and young rats. Guineapigs were also inoculated, but, though they showed febrile symptoms, organisms were never demonstrated in the blood, though the serum developed the power of immobilizing the organisms in the blood of mice in twenty minutes. The chief interest in the paper lies in the conclusion reached that the organism with its rigid body and terminal flagella is not a spirochaete but a spirillum. It is further pointed out that the human strain cannot be differentiated from strains isolated from animals. In 1887, CARTER recorded *Spirillum minor* from the blood of rats in India, and this organism appears to be identical with the forms subsequently named *Spirochaeta laverani*, *S. muris*, *S. morsus muris* and *S. petit*. It is concluded that the correct name for the organism of rat-bite fever is *Spirillum minus* Carter, 1887.

The paper gives a good description of the organism which, apart from the flagella, varies in length from 1·5 to 10 microns, while the number of coils may be as few as one-and-a-half, or as many as eight or nine. The short forms which probably result from recent divisions have a single flagellum. The longer ones have a flagellum at each end. In stained films there may appear to be more than one flagellum at each end, but this seems to be the result of fixation, as the living organism shows only one.

C. M. Wenyon.

TEJERA (Enrique). **El "*Spirochaeta morsus muris*," microbio del "Sodoku" en las ratas de Caracas.**—*Gac. Med. de Caracas.* 1924. Mar. 15. Vol. 31. No. 5. pp. 65–67.

The author has demonstrated the presence of the organism of rat-bite fever in ten per cent. of the rats of Caracas. The discovery leads him to suspect that the human disease will be found to occur in the same locality. He states that he has cultivated the organism in Noguchi's medium, and has reproduced the disease in rats by inoculating them with cultural forms. In the inoculated animals the organisms appear in the blood on the 7th day. They multiply, and after the 15th day they accumulate in large numbers in the connective tissues, especially in the submucosal tissues of the eyelids and tongue.

The majority of observers who have attempted to cultivate the organism have failed entirely, though ONORATO and SHIMAMINE (this *Bulletin*, Vol. 21, p. 740) claim to have done so in a special medium.

C. M. W.

CORINALDESI (Silvio). **Un caso interessante di Sodoku.**—*Riforma Med.* 1924. May 19. Vol. 40. No. 20. pp. 463–464. [9 refs.]

The paper records a case of rat-bite fever of exceptionally long duration. The patient, a woman of 51 years of age, was bitten in December 1919. The disease commenced with fever 15 days later, and from that time till July 1923 she suffered from periodic attacks. She came into hospital on July 12, 1923, during one of these attacks, and was treated with subcutaneous injections of atoxyl. She left hospital on August 2 and continued injections at home. When seen on November 20 she was in perfect health, and had had no further attacks. The diagnosis was made clinically, the attempts to discover the organism having given only negative results.

C. M. W.

REDDY (H. L.). **Rat Bite Fever** (*Spirochaeta morsus muris*).—*Canadian Med. Assoc. Jl.* 1924. Aug. Vol. 14. No. 8. p. 741.

A case of rat-bite fever in Montreal, of interest in that two doses of 0·3 gm. of novarsenobenzol given during the first attack and one week later did not prevent a second attack. A 3rd injection of 0·4 gm. of the drug brought about a remission of the fever in 6 hours. Three weeks later a third attack was experienced and was controlled in a similar manner. Weekly injections were then instituted for eight weeks, after which no further attacks were noted during two months' observation.

C. M. W.

SHATTUCK (George Cheever) & THEILER (Max.). **Rat-Bite Disease in the United States with Report of a Case.**—*Amer. Jl. Trop. Med.* 1924. Sept. Vol. 4. No. 5. pp. 453–460. With 1 chart. [8 refs.]

Description of a case of rat-bite fever in a baby 3½ months old. This appears to be the first case in the United States in which the diagnosis was confirmed by the discovery of the spirochaete, which was isolated by inoculating mice and guineapigs with blood from a vein. Examination of the local lesion and enlarged glands revealed no organism. The primary lesion, presumably the result of a rat-bite, was above the left eye, and, apart from fever, the patient suffered from enlarged glands and a rash which resembled that which may occur after the injection of serum.

C. M.W.

COLLIER (W. T.). **Two Cases of Rat-Bite Fever.**—*Brit. Med. Jl.* 1924. Aug. 16. p. 265. With 1 chart.

A record of two cases of rat-bite fever in Oxford, one caused by the bite of a cat and the other by a rat. Spirochaetes were discovered in the second case only, but both were typical and responded to treatment with novarsenobillon.

C. M. W.

MEHTA (Balkrishna N.). **Sulfarsenol in Rat-Bite Fever.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 567–568. With 1 chart.

A case which clinically appeared to be rat-bite fever in spite of failure to obtain any satisfactory history of a rat-bite was cured by two intramuscular injections of sulfarsenol. Two doses of 18 cgm. were given with an interval of six days.

C. M. W.

INFECTIOUS JAUNDICE.

BUCHANAN (George). **Spirochaetosis Icterohaemorrhagica. The Presence of the Causal Organism in Slime as a Source of an Outbreak in East Lothian.**—*Brit. Med. Jl.* 1924. Nov. 29. pp. 990–993. [15 refs.]

In connection with the outbreak of Weil's disease in Scottish mines, the author has made the most interesting observation that the slime on the roof of a certain mine contained scanty but typical leptospira, and that 4 cc. of the slime inoculated intraperitoneally to two guineapigs gave rise to a condition resembling in every way that produced by the injection of organisms from cases of the disease, the animals dying on the eleventh and thirteenth days. Abundant leptospira were present in all the organs examined, while an appreciable number were found in the blood and urine. There was intense jaundice, widespread subcutaneous, muscular and internal haemorrhages, enlargement of the spleen and haemorrhage in the stomach. The slime, which was with difficulty detached from the stone roof, was greyish-brown in colour and translucent when freed from carbon particles. Its consistency approached that of a thick gum solution, its temperature in February was 11·7°C., it was slightly alkaline when tested

with litmus and had a reaction of pH 7·5 approximately. Other organisms were present and included algae, fungi, cocci, bacilli, spirochaetes, flagellates and nematodes and their ova. It is significant that when the outbreak of Weil's disease occurred work was being conducted in this particular section, which was known to be the wettest part of the mine. Eight miners developed symptoms of spirochaetal jaundice and five of them fell ill in a period of two weeks, while working in this wet cutting. Rats were never considered to be numerous in the pit, and an expert rat-catcher failed to trap any underground, though one animal caught at the pit surface was found to be infected with pathogenic leptospira. The bearing of the observations on the etiology of Weil's disease is carefully discussed and reference is made to the various records of the occurrence of leptospira in water.

C. M. Wenyon.

RAILLIET (G.). **A propos d'une petite épidémie de spirochétose ictérigène chez les baigneurs de la Vesle.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Nov. 13. Year 40. 3rd Ser. Vol. 48. No. 32. pp. 1502–1508. [6 refs.]

The paper describes a series of four cases of infectious jaundice which came under observation between the 15th and 25th August, 1923. All were in young men who frequented certain bathing places in the River Vesle near Rheims, and it is presumed that the infection was contracted there. An examination of the mud and water from the river revealed an organism resembling *Leptospira icterohaemorrhagiae*, which, however, was not pathogenic to guineapigs nor agglutinated by the specific serum of Weil's disease. About six weeks after this outbreak there occurred a more extensive one of what appeared to be benign catarrhal jaundice. In certain cases several members of one family were affected. The serum in one instance gave a positive reaction against *L. icterohaemorrhagiae*. In December a typical case of Weil's disease was observed. The outbreak persisted from October to February, and the author notes that at the time of writing the article in October, 1924, cases of the benign type were again appearing. He realizes the investigation is incomplete, but the association of the two types of case is sufficiently suggestive to indicate the necessity of investigating all epidemics of mild jaundice from the point of view of *Leptospira icterohaemorrhagiae*.

C. M. W.

TOHYAMA (Yuzo). **Experimental Studies and Actual Test Results concerning Prophylaxis of Weil's Disease (Spirochaetosis Icterohaemorrhagica) agriculturally viewed.**—*Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. pp. 193–198.

In this paper the author describes in greater detail the experiment which led him to the conclusions made in his earlier publications (this *Bulletin*, Vol. 21, p. 275). It is found that in experimental ricefields the leptospira of Weil's disease will not thrive if the reaction of the water exceeds a certain degree of acidity, whereas if the reaction is alkaline or only slightly acid, as it is after use of the fertilizers commonly employed in Japan, the organism will live and remain virulent for about two months. Calcium cyanamide ($CaCN_2$), on the other hand, is not only beneficial to the crops, but kills the spirochaetes, and its use as a constituent of fertilizers is recommended. Practical tests in

certain heavily infected areas fully justified the results obtained experimentally. An interesting point is that it appears that high incidence of infection amongst human beings is not associated with a corresponding increase in incidence amongst rats. The paper contains a large number of data relating to the chemical composition and reactions of the soil media in which the leptospira will thrive and the types of soil which are most suitable for its development.

C. M. W.

BONNE (C.). **Conservation du Spirochète ictéro-hémorragique dans les Punaises.**—*C. R. Soc. Biol.* 1924. July 4. Vol. 91. No. 23. pp. 242–243. [1 ref.]

The claims of BLANCHARD, LEFROU and LAIGRET (this *Bulletin*, Vol. 20, p. 582) that a disease resembling Weil's disease in equatorial Africa is transmitted by bed bugs led the author to investigate the possibility of transmission of Weil's disease from guineapig to guineapig by bed bugs in France. The bugs were fed on infected animals and afterwards on clean ones. In no case did infection result, though it was proved by the inoculation of crushed bugs into guineapigs that the leptospira could survive for two days in the bugs.

C. M. W.

ROBINSON (George H.). **Occurrence of** *Leptospira icterohemorrhagiae* **in Wild Rats of Baltimore.**—*Amer. Jl. Hyg.* 1924. July. Vol. 4. No. 4. pp. 327–329. [8 refs.]

About 7 per cent. of the wild rats of Baltimore are infected with *Leptospira haemorrhagiae*. Dark-field examination of kidney emulsions will give a larger percentage of findings than inoculation of guineapigs, as certain strains are without virulence for these animals. The carrier condition can be produced in white rats, the leptospira retaining its virulence for at least four months. It is amongst full grown rats that carriers are most likely to be found.

C. M. W.

GUITERAS, LEBREDO & HOFFMANN (W. H.). *Leptospira Icterohemorragica* **en la Habana.**—Reprinted from *San. y Benefic. Bol. Ofic.* 1921. Aug. Vol. 26. No. 2. p. 39. [1 ref.]

As *Leptospira icterohaemorraghiae* has been discovered in the rats of Havana the attention of the sanitary authorities is called to this disease, which in many respects simulates yellow fever. In countries where yellow fever is likely to occur the recognition of the differences between the two diseases is of considerable importance.

C. M. W.

COURCOUX (A.) & CORDEY (A.). **Spirochétose ictéro-hémorragique au cours d'une syphilis secondaire.**—*Jl. Physiol. et Path. Générale.* 1924. Apr. Vol. 22. No. 2. pp. 345–348.

The paper describes a case of Weil's disease in a man during treatment with mercury for secondary syphilis and after an incomplete course of novarsenobenzol. The diagnosis was confirmed by serological tests carried out at the Pasteur Institute.

C. M. W.

CARBO NEBOA. [**Primer caso de Leptospirosis ictero-hemorrágica en el Ecuador.**]—*An. de la Soc. Méd.-Quirurg. d. Guayas.* 1923. Vol. 4. No. 8. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 299.]

——. [**Leptospirosis Icterohemorrhagiae in Ecuador.**]—*An. de la Soc. Méd.-Quir. Guayaquil.* 1924. Feb. Vol. 4. p. 97. [Summarized in *Jl. Amer. Med. Assoc.* 1924. June 14. Vol. 82. No. 24. p. 1998.]

A record of three cases of Weil's disease in Ecuador. The organism was isolated by inoculation of guineapigs.

C. M. W.

VANNI (Vittorio). **Sulla chemioterapia della spirochetosi ittero emorragica.**—*Riforma Med.* 1924. Sept. 29. Vol. 40. No. 39. pp. 916–917. [3 refs.]

The author has found that tartar emetic has a spirochaetocidal action when added to cultures of *Leptospira icterohaemorrhagiae.* One centigram of the drug added to 1 cc. of culture will change the organisms to such an extent that they will no longer infect guineapigs. Treating animals after injection of 1 cc. of culture with repeated doses of tartar emetic has a definite effect on the course of the disease. If treatment is commenced before the liver has become seriously involved, the development of the disease is delayed to such an extent that death has been postponed from the usual day (3rd to 7th) to the 16th day. These results lead the author to believe that tartar emetic will be of service in the treatment of the human disease.

C. M. W.

CASTILLO. **Ueber pathologisch-anatomische Befunde und das Verhalten der Spirochäten beim experimentellen Morbus Weil des Meerschweinchens insbesondere über die durch Spirochäten erzeugten Lebernekrosen.** [The Pathologico-Anatomic Findings, and the Retention of Spirochaetes in Experimental Weil's Disease in Guineapigs, and particularly on the causing of Liver Necrosis by Spirochaetes.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1924. Vol. 247. No. 3. pp. 520–530. With 3 text figs. [5 refs.]

A detailed histological examination of the tissues of guineapigs suffering from experimental Weil's disease shows very characteristic changes in the liver, in the shape of small necrotic areas which can often be detected only by microscopical examination. The periphery of each area is occupied by a tangled network of leptospira surrounding and enmeshing necrotic liver cells. There can be no doubt that these necroses are caused by the organisms and they may throw light on the lesions produced by other spirochaetal infections, such as syphilis.

C. M. W.

HIYEDA (Kentaro). [**On the Changes of the Arteries and the Condition of the Haemorrhages in Spirochetosis Icterohemorrhagica.**]—*Fukuoka Ikadaigaku Zasshi* (*Jl. Fukuoka Med. College*). 1924. Jan. & Mar. Vol. 17. Nos. 1 2 & 3. [Summarized in *Japan Med. World*. 1924. May 15 & Aug. 15. Vol. 4. Nos. 5 & 8. pp. 123; 206.]

In Weil's disease it was found that definite changes occurred in the elastic fibres of the arteries, while the muscle fibres were unaffected except in cases of long duration when there was some proliferation of the nuclei. These changes are responsible for the haemorrhages which are characteristic of the disease. They occur chiefly where the vessels branch. Haemorrhages into the intima and externa are often found, while infiltration with round cells occurs early in the disease.

C. M. W.

TROISIER (J.) & RIMÉ. **Réactions de floculation et séro-diagnostic dans le liquide céphalo-rachidien et dans le sang au cours de la spirochétose ictéro-hémorragique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 26. Year 40. Vol. 48. 3rd Ser. No. 22. pp. 912–917. [5 refs.]

Having under observation a case of Weil's disease which was characterized by severe meningeal symptoms the authors made a series of serological tests. It was found that agglutinins and lysins were present in equal amounts in the blood and cerebrospinal fluid. In each case a dilution of 1/1000 gave a positive reaction. The reaction of Guillain with colloidal benzoin was negative in every one of sixteen tubes of cerebrospinal fluid, a result which is the reverse of what occurs in syphilis of the nervous system. It appears evident that it is not the mere presence of immune bodies which brings about the flocculation in this reaction. Another reaction, that of Vernes, was tested. Two samples of serum taken on the 8th day of the illness gave figures of 1 and 3; on the 12th day it was 0 and on the 19th day 2. Thus, during the height of the illness and during early convalescence, very low figures were obtained, another instance of the difference between Weil's disease and syphilis. Further, the reactions of Wassermann and those of Bauer and of Hecht made on three occasions were entirely negative. These results illustrate the fundamental differences between the two types of spirochaetes, both of which with equal frequency give rise to meningeal symptoms. The case is described in detail, the final diagnosis having been made by the production of the typical picture in a guineapig inoculated with the cerebrospinal fluid withdrawn on the 7th day of the illness. The blood, urine and duodenal contents failed to infect.

C. M. W.

GARNIER (Marcel). **Remarques à propos de la communication de MM. J. Troisier et Rimé sur la spirochétose ictéro-hémorragique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. July 17. Year 40. 3rd Ser. Vol. 48. No. 25. pp. 1092–1093. [2 refs.]

In two cases of Weil's disease TROISIER and RIMÉ removed fluid from the duodenum by means of the duodenal tube and injected it into two guineapigs on each occasion. None of the animals became

infected. The present author points out that success could hardly have been expected, since bile and bile salts are known to destroy leptospira. He thinks that the disappearance of the organisms from the blood when jaundice develops may be due to the presence of bile. Guineapigs inoculated with virulent doses of leptospira together with bile do not become infected, but they develop no immunity and are easily infected later. The author also remarks on the failure of the above-named observers to infect guineapigs with the urine of their cases. He notes that the spirochaetes appear in this situation irregularly, and unless they are actually seen there after centrifugation there is little chance of infecting animals.

C. M. W.

PETTIT (Auguste) & ETCHEGOIN (Eugenio). **Sur la présence d'agglutinines pour le** *Spirochaeta icterohemorrhagiae* **dans le liquide céphalo-rachidien.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 26. Year 40. Vol. 48. 3rd Ser. No. 22. pp. 918–919.

The cerebrospinal fluid in two cases of Weil's disease was proved to contain agglutinins for the specific organism. In one case the fluid was taken on the 8th day of the disease; in the other, which is the case reported on by TROISIER and RIMÉ, on the 23rd day. In the second case it is possible that the agglutinins resulted from the injections of antispirochaetal serum which were given, but this explanation does not apply to the first.

C. M. W.

VANNI (Vittorio). **Sopra un metodo di coltivazione della spirocheta ittero-emorragica.**—*Policlinico.* Sez. Prat. 1924. July 28. Vol. 31. No. 30. pp. 966–968. [4 refs.]

A method of culture of *Leptospira icterohaemorrhagiae* is described. A small piece of the liver of a guineapig is covered by a mixture of equal parts of physiological saline solution and horse serum. The horse serum used may be that issued in phials for therapeutic purposes. In this medium rapid growth occurs. The organisms have been cultivated from the urine of guineapigs and the author believes the medium will be useful for diagnostic purposes.

C. M. W.

TROISIER (J.). **Les séquelles rénales tardives de la spirochétose ictéro-hémorragique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 26. Year 40. Vol. 48. 3rd Ser. No. 22. pp. 910–911.

The author believes that a disease diagnosed as "hepatic typhus" in a patient 73 years of age was undoubtedly Weil's disease. Four years later the patient died with all the symptoms of a chronic nephritis which was confirmed at the post-mortem examination. It appears possible that the proclivity of the spirochaete for the kidney may be one of the causes of chronic nephritis.

C. M. W.

THOMAS (Roy E.). **Acute Infectious Jaundice. (With Case Reports.)**—*Southwestern Med.* 1924. July. Vol. 8. No. 7. pp. 314–318.

This paper describes 12 cases of the disease known as acute infectious jaundice, an epidemic of which recently visited New York State. The cause of the disease is unknown, and there is no evidence to show that it is *Leptospira icterohaemorrhagiae*. Catarrhal jaundice is probably a sporadic form of the disease.

C. M. W.

ANIGSTEIN (L.). *Leptospira icterohaemorrhagiae* **chez les rats sauvages de Varsovie.**—*C. R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1358–1359.

BEGER (H.). **Ueber aktive Immunisierung mit "gekupferten" Spirochätenkulturen bei der Weilschen Krankheit.**—*Arb. a. d. Reichgsndhtsamt.* 1924. Vol. 54. No. 3. pp. 355–360.

YELLOW FEVER.

NOGUCHI (Hideyo), MULLER (Henry R.), TORRES (Octavio), SILVA (Flaviano), MARTINS (Horacio), RIBEIRO DOS SANTOS (Alvaro), VIANNA (Godofredo) & BIÃO (Mario). **Experimental Studies of Yellow Fever in Northern Brazil.**—*Monographs of the Rockefeller Inst. for Med. Res.* 1924. Aug. 9. No. 20. 36 pp. With 3 text figs. & 5 plates. [26 refs.]. Also shorter version in *Jl. Amer. Med. Assoc.* 1924. Sept. 13. Vol. 83. No. 11. pp. 820–823. [22 refs.]

During the years 1921–1923 yellow fever has gradually increased in the towns in the interior of the State of Bahia, Brazil. As two commissions, one from the Oswaldo Cruz Institute and the other from the Institute of Hygiene, São Paulo, had failed to isolate *Leptospira icteroides* from these cases, the International Health Board sent an expedition under Noguchi. It was able to isolate two strains of *L. icteroides* from two of 9 cases of yellow fever in Villa Bella das Palmeiras, an interior town, by inoculation of culture media with blood drawn on the 1st and 2nd days of illness. With these strains, as well as with sera from nine recovered cases of the disease, a number of experiments were undertaken which proved the identity of yellow fever occurring in Ecuador, Mexico, Peru, Colombia and Brazil. The organism isolated in Brazil was not at first very virulent to guineapigs but the virulence was increased several thousand-fold by the 3rd passage. Two monkeys, *Cebus macrocephalus,* developed typical symptoms of severe yellow fever when inoculated with the Brazilian virus. One died on the 7th day and revealed the pathological changes typical of human yellow fever. Three African baboons and a monkey of the species *Ateleus ater* developed only slight fever on the 3rd or 4th day. In young dogs a severe and fatal infection with characteristic lesions was induced. It was demonstrated that the virus was capable of passing through the Berkefeld V and N filters. Guineapigs which had received 0·0001 cc. of anti-icteroides serum prepared in horses with strains of *L. icteroides* of Ecuador, Mexico and Peru were protected against 1000 minimum lethal doses of the Brazilian virus.

The monograph is illustrated by a series of coloured plates showing the character of the changes produced in the organs of the infected monkeys.

C. M. Wenyon.

NOGUCHI (Hideyo) & FRÓES (João A. G.). **Etiologia da febre amarella e reconhecimento na Bahia do** *Leptospira icteroides.* **Correspondencia trocada sobre esse assumpto entre os professores.**—19 pp. [31 refs.] 1924. Bahia: Imprensa Official.

Certain correspondence which took place between the gentlemen mentioned on the subject of yellow fever in Brazil and the demonstration of *L. icteroides* in this country.

C. M. W.

NIGERIA. **Annual Report on the Medical Research Institute for the Year 1922.** [1923, Lagos: Govt. Printer.]—**Report on Yellow Fever Outbreak at Warri during October and November, 1922.** [YOUNG (W. A.), Assistant Bacteriologist, in charge of Branch Clinical Laboratory, Colonial Hospital, Lagos], pp. 39–40.

Dr. W. A. Young, the author of this note, went to Warri, S. Nigeria, to investigate an outbreak of yellow fever. Two cases occurred, one in an Italian who died before the author's arrival and the other in a native who did not become seriously ill till the 5th day, when he commenced to pass tarry stools and to bring up large quantities of black vomit. He was given 20 cc. of Noguchi's serum, after which his condition improved to such an extent that he made an uninterrupted recovery. The post-mortem findings of the fatal case were typical of yellow fever, except that the changes in the liver were more like those of Weil's disease. Histological examination of the tissues again showed a condition which would apply to Weil's disease rather than yellow fever.

C. M. W.

HOFFMANN (W. H.). **Kalkzylinder in den Nieren beim Gelbfieber.** [Renal Lime Casts in Yellow Fever.]—*Muench. Med. Woch.* 1924. July 4. Vol. 71. No. 27. pp. 898–899.

——. **Los cilindros de cal en los riñones, un nuevo signo diagnóstico de la fiebre amarilla.**—*Sciencia Medica.* Rio de Janeiro. 1924. June 30. Vol. 2. No. 6. pp. 284–285; and *Academia de Ciencias medicas, fisicas y naturales de La Habana.* Sesión ordinaria del 4 de julio de 1924. 3 pp.

——. **Is there Yellow Fever in Africa ?**—*Jl. Trop. Med. & Hyg.* 1924. July 15. Vol. 27. No. 14. p. 199.

——. **The Histopathology of Yellow Fever.**—*Ibid.* Sept. 1. No. 17. pp. 235–240. [1 ref.]

——. **La histopatologia de la fiebre amarilla.**—*Rev. Med. y Cirug. Habana.* 1924. May 25. Vol. 29. No. 10. 4 pp.

The author has studied carefully the histological changes which occur in guineapigs infected with *L. icteroides* and *L. icterohaemorrhagiae.* The most striking result of this examination was the fact that the two experimental infections in these animals produced identical lesions which differed in a remarkable manner from the changes which were supposed to occur in human beings who had died of yellow fever. Fortunately, during the epidemic of the disease in 1906–1908 Dr. GUITERAS had preserved a large quantity of material from which the author has studied over 30 cases. It has resulted that the striking differences which were supposed to exist between the disease in man and animals actually do not occur. Further, there is a similarity between the lesions in man produced by Weil's disease and yellow fever, the only differences noted being those due to the greater severity of the latter, which produces certain characteristic changes in the liver and kidney. The chief points to be noted in yellow fever are as follows:—

Liver.—There is complete and fundamental destruction of the whole microscopical structure of the organ, so that in advanced cases it would

be impossible to identify it. It has been claimed that the necrotic cells occurred in the intermediate zone of the acini only, and that near the central vein and periphery only fatty changes occurred so that the general outline of the acini was maintained. Of all the cases examined not a single one showed this picture, though it was found to occur in cases which were not yellow fever but septicaemia resulting from appendicitis. In Weil's disease such a high degree of necrosis is not usually found, though exceptionally an approach to the condition observed in yellow fever occurs. In the case of guineapigs infected with the organisms of both these diseases there is never necrosis of the cells but only cloudy swelling. It appears that the liver-cells of these animals are more resistant to the toxins than the liver-cells of man. Another characteristic feature of the human liver in yellow fever is the occurrence of phagocytosis of red corpuscles by the endothelial cells (Kupffer cells).

Spleen and lymph nodes.—The chief abnormality in these organs is the presence of large phagocytic cells which have ingested red corpuscles.

Kidney.—This organ next to the liver is most seriously affected, and the lesions which occur here are probably responsible for the deadly character of the disease. There is pronounced fatty degeneration and necrosis, with desquamation of the epithelium of the convoluted tubules and Henle's loops. Casts are formed, and what has not hitherto been noticed is the presence of lime casts which can easily be recognized in sections stained with haematoxylin. The formation of these lime casts appears to be pathognomonic of yellow fever as compared with Weil's disease, malaria, blackwater fever and relapsing fever. They do not occur in experimentally infected guineapigs, but have been found in young dogs. This particular feature, it is thought, will form a new method for differential diagnosis, and will be of particular value at the present moment in suspicious cases in West Africa.

Muscles.—Both the voluntary muscles and those of the heart show generalized hyaline or waxy degeneration of Zenker.

Stomach and intestine.—Apart from the well-known changes, the intestine showed a leucocytic infiltration of the solitary follicles and Peyer's patches.

Salivary glands and pancreas.—There is a slight degree of degeneration of the glandular cells.

Suprarenals.—These show only a slight degree of the degeneration which is so marked in the case of the experimental disease in guineapigs.

Other organs.—No changes which were not general throughout the body were noted. The walls of blood vessels, as in all the organs examined, revealed degenerative changes which are undoubtedly responsible for the characteristic haemorrhages which occur in the disease.

It thus appears that the human tissues are very susceptible to the toxins generated by the spirochaetes, while those of guineapigs are more resistant. The suprarenals alone appear to be more affected in these animals. The tissues of young dogs, on the other hand, occupy an intermediate position as regards their susceptibility.

C. M. W.

AGRAMONTE (Aristides). **Some Observations upon Yellow Fever Prophylaxis.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 1. Vol. 27. No. 21. pp. 285–287.

In this paper the author gives expression to his views regarding the etiology of yellow fever and warns sanitarians against the dangers which arise from the acceptance of *Leptospira icteroides* as the causative agent of the disease. Apart from the fact that several investigators have failed to isolate the organism from cases of yellow fever, there are other points in which the experimental results obtained with the organisms do not agree with the fundamental truths upon which all prophylactic measures have been founded. These are: 1. The parasite requires a mosquito as its intermediate host. 2. The parasite is present in the peripheral blood only during the first three or possibly four days of the disease. 3. A definite period of incubation, which is about 12 days, is required before a mosquito becomes infective. 4. The period of incubation in human beings is not greater than 6 days. Any prophylactic procedure which leads to a disregard of any of these fundamental truths is a danger. The prophylactic vaccine and the curative serum introduced by NOGUCHI come into this category, for the author believes that they are of very questionable value. Another result has been the attempt to establish the incubation period as 12 days as a result of experiments in animals, in spite of the fact that the investigations in man conducted by the Army Board in 1901 showed it to be 6 days.

The author is convinced that anything that tends to give rise to a feeling of false security, such as that engendered by so-called protective vaccination, leading to a neglect of those prophylactic measures which have yielded such satisfactory results in the field of practical sanitation, is to be deprecated. He thinks that until experiments on human beings have established the relation of *L. icteroides* to yellow fever and the influence of the vaccine and serum prepared from it the results of animal experiments should not be allowed to alter in any way the known methods of yellow fever control. When injected into guineapigs *L. icteroides* gives rise to a condition which is practically identical with that caused by *L. icterohaemorrhagiae*, yet in man yellow fever and Weil's disease are clinically and pathologically entirely unlike. The serological tests which differentiate these organisms are in his opinion insufficient to establish any specific difference, for in the case of other spirochaetal infections they merely indicate a difference in strain. He does not pretend to say what part *L. icteroides* plays in the pathology of yellow fever, nor does he cast doubt on the diagnosis of the cases from which it was isolated. He suggests tentatively that it may possibly be a symbiotic organism responsible for producing the haemorrhagic phase of the disease.

As regards the practical prevention of yellow fever, reliance is placed upon, firstly, the immunity of the individual, and, secondly, adequate prophylactic measures. The author believes that sanitary officers pay too little attention to the demonstrable rôle which children play in maintaining the endemic conditions in various localities. He thinks that the existence of the disease in such latent sources, as GUITERAS originally pointed out, is the cause of epidemics at long intervals without the introduction of new cases.

C. M. W.

MULLER (Henry R.). **Histopathology and Haematology of Experimental Yellow Fever.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 15. Vol. 27. No. 22. pp. 299–304. [3 refs.]

Young guineapigs, young puppies and a monkey (*Cebus macrocephalus*) experimentally infected with yellow fever revealed histological changes similar to those found in yellow fever in man. In guineapigs a steady and persistent leucopenia of moderate degree is the rule during severe infections. The number of red cells usually remained within the normal limits, though occasionally a marked reduction took place. The haemoglobin was usually normal. These findings are similar to those recorded for yellow fever in man.

C. M. W.

NOGUCHI (Hideyo). **The Etiology of Yellow Fever.**—*Proc. Inst. of Med. Chicago.* 1921. Vol. 3. No. 4. pp. 217–219. With 2 figs.

A brief summary of the investigations which have led the author to the view that *Leptospira icteroides* is the etiologic agent of yellow fever.

C. M. W.

PERRÍN (Tomás G.). **La leptospira de Noguchi.**—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1923. Aug. Vol. 2. No. 2. pp. 1–17. With 6 plates.

TORRES (Octavio). **O isolamento da "*Leptospira icteroides*" Noguchi na Bahia.**—*Sciencia Medica.* 1924. May 31, July 31 & Aug. 31. Vol. 2. Nos. 5, 7 & 8. pp. 219–241; 313–330. With 17 charts. 394–418. With 1 chart & 3 figs.

KALA AZAR.

KNOWLES (R.), NAPIER (L. E.) & SMITH (R. O. A.). **On a Herpetomonas found in the Gut of the Sandfly,** *Phlebotomus argentipes*, **fed on Kala-Azar Patients. A Preliminary Note.**—*Indian Med. Gaz.* 1924. Dec. Vol. 59. No. 12. pp. 593–597. [8 refs.]

The authors have discovered that laboratory-bred *Phlebotomus argentipes* acquired a leptomonas infection after being fed on kala azar cases in Calcutta. A large number of wild flies, including *P. minutus* 207 males and 94 females, *P. argentipes* 317 males and 90 females, and 103 unidentified flies showed no infection. Further, 46 laboratory-bred *P. argentipes* fed on cases other than kala azar developed no infection. The flies fed on the kala azar cases were 56 in number, and 25 of these became infected. In 6 the infection was a heavy one. It is noted that Major SINTON points out that the known distribution of *P. argentipes* in India coincides with that of kala azar. The authors are careful to avoid speculation as to the bearing of these observations on the problem of kala azar transmission but they state that further experiments are in progress. They refer to MACKIE's (1914) discovery of leptomonas in sand flies in Nowgong [this *Bulletin*, Vol. 5, p. 282], and they believe this to be the only observation of the kind which has been made. The reviewer discovered flagellates of this type in sand flies in Aleppo.*

C. M. Wenyon.

SHORTT. **The Present Position as Regards the Problem of Transmission of Kala-Azar.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 8–18.

The author discusses the problem of kala azar transmission under the two headings, probable and possible theories. Under probable theories the bed bug and sand fly are considered, the former on account of its fitting in with house infection and the numerous experiments which have been made in connexion with the development of *L. donovani* in its intestine, and the latter because of analogy with oriental sore and the presence of natural leptomonas infections. Under possible theories other possible animal transmitters, including conorrhinus, fleas, mosquitoes, lice and ankylostomes are considered, as well as more direct methods through the mouth as a result of contamination of food from urine, faeces or sputum. The investigations which have been conducted under these various headings are reviewed, but it is admitted there are other fields for investigation which the paper does not cover.

C. M. W.

YOUNG (T. C. McCombie). **The Kala-Azar Transmission Problem** [Correspondence.]—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. p. 529.

The writer believes that the suggestion made by KNOWLES & DAS GUPTA of a latent form of kala azar in man fits in with his epidemiological experience of the extraordinarily sensitive response of endemic kala azar to any influences which act adversely on the public health.

C. M. W.

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* WENYON (C. M.). Note on the Occurrence of Herpetomonas in the Phlebotomus of Aleppo.—*Jl. London School Trop. Med.*, 1912. Vol. 1, Pt. 2, p. 98.

KNOWLES (R.) & DAS GUPTA (Biraj Mohan). **On Transient Infections with *Leishmania donovani* in Man and Animals.**—*Indian Med. Gaz.* 1924. June. Vol. 59. No. 6. pp. 292–295. [7 refs.]

In a previous paper (this *Bulletin*, Vol. 20, p. 866) it was suggested that there was some reason to suspect that symptomless cases of infection in man with *L. donovani* occurred. In the present paper cases are quoted which support this contention. In animals inoculated with kala azar virus one of four things happens. The animals may not become infected, they may acquire dermal lesions if the injection has been made into the skin, they may become infected but remain in perfect health finally recovering from the infection, or they may acquire what is to all intents and purposes acute kala azar. There is evidence that in human beings the same series of events may follow exposure to infection. In even the severest outbreaks of the disease only a limited percentage of the population die of the disease, a fact which suggests that certain individuals resist infection. It has been shown by BRAHMACHARI (this *Bulletin*, Vol. 19, p. 551) that *L. donovani* may produce cutaneous lesions. The mortality of known infected cases when left untreated is not cent. per cent., so that natural recoveries do occur. Further, the literature contains records of individuals who have been found to be infected with *L. donovani* though there were no symptoms of the disease. Two cases are quoted in which spontaneous recovery had taken place. The fourth type of infection in animals is represented by the typical picture of kala azar in man. The authors reflect that if infections with *L. donovani* in man are anything like what they are in animals it may be that kala azar in man is but the end-phase of a more widespread and usually symptomless infection.

C. M. W.

NICOLLE (Charles) & ANDERSON (Charles). **Recherches expérimentales sur le mode de transmission du kala azar. Deuxième mémoire.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 155–164. [1 ref.]

This paper gives an account of the results obtained by a continuation of the investigations previously described (this *Bulletin*, Vol. 20, p. 866) whereby the authors attempted to transmit kala azar from dog to dog by carefully arranged experiments with fleas. The attempt to maintain a virus in dogs by successive passages was made. It was first secured from a naturally infected dog on 28 December, 1920, and several dogs were inoculated on each occasion, so that for 9 passages at least one infection occurred. At the 10th passage 5 dogs were inoculated but no infection resulted. Another virus of canine origin is now at its 8th passage. Further experiments on attempted flea transmission were made as follows:—Two young dogs were exposed for 10 months to various batches of fleas which were collected from two known infected dogs over a period of 5 to 6 months. The fleas were introduced into the cage. The dogs were examined 2, 5, 7, 8, 9 and 10 months after the commencement of the experiment, and were finally killed. There was no evidence of infection, though they were infested with large numbers of fleas. Two other young dogs during the course of 3 and 3½ months were made to ingest 510 and 410 fleas collected from a known infected dog. Examinations similar to those in the first experiment were made, including culture from the spleen and bone

marrow, and no infection was demonstrated. The authors conclude that they have reason to assert definitely that the dog flea plays no part in the transmission of kala azar from dog to dog.

C. M. W.

KNOWLES (R.) & DAS GUPTA (B. M.). **The Diagnosis of Kala-Azar by Examination of Thick Blood Films.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 438–440. [6 refs.]

The examination of blood for *L. donovani* by the thick-film method has enabled the authors to discover parasites in the peripheral blood of 67 per cent. of a series of 55 cases of kala azar. The technique is as follows:—Four drops of blood on a perfectly clean and grease-free slide are taken from a cleaned finger and mixed so as to cover an area of ¼ square inch. The film, covered with a Petri dish, is dried in the air or in the incubator at 37°C. for one to two hours. It is then flooded with the dehaemoglobinizing mixture (glacial acetic acid 2·5 per cent. in distilled water—4 parts; crystalline tartaric acid 2 per cent. in distilled water—1 part). The action should be complete in 5 to 10 minutes. The fluid is then tilted off and the slide is flooded with methyl alcohol which is left for one minute. The film is then thoroughly washed in distilled water to remove all trace of acid, after which it is stained with Giemsa stain (1 drop in 1 cc.) for 10 minutes. It is then washed in distilled water and allowed to dry by tilting it against any vertical surface. The parasites will be found in the leucocytes.

C. M. W.

SHORTT (H. E.) **The Relative Value of Diagnostic Methods, and Evidence of Cure in Kala-Azar.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 551–552. [2 refs.]

The author believes that as regards diagnosis of kala azar, culture from the liver gives as good results as culture from the spleen and that this is the surest means of discovering leishmania. Direct examination of smears from puncture material from these organs holds the second place, while the aldehyde reaction and examination of the peripheral blood are next in value. When the question of cures arises after treatment it frequently happens that the spleen has become so reduced in size that puncture of the liver is a more simple operation. In these cases culture from the liver is quite as reliable as culture from the spleen, and the author states that he has yet to meet the case in which the one organ has given a different result from the other.

C. M. W.

JEMMA (R.). **Considerations on the Diagnosis and Therapy of Leishmaniasis.**—*Jl. Oriental Med.* 1924. Aug. Vol. 2. No. 3. pp. 228–232. With 1 plate.

This paper gives a summary of the author's experience with infantile kala azar at the Pediatric Clinic, Naples. He believes that the disease is spreading, quite apart from the fact that improved methods of diagnosis and the increased vigilance of practitioners in general are augmenting the opportunities for its identification. It appears that in Italy kala azar is most frequent in the first year of life. The value of

examination of the bone marrow for diagnostic purposes is emphasized. As regards treatment, intravenous injections of tartar emetic remains the only reliable method. It is a good rule not to give large doses. A maximum dose of 3 to 4 centigrams twice a week for children under 3 years of age, or 4 to 5 when the children are older, will bring about cure in two or three months. As certain cases appear intolerant of tartar emetic it is well to begin with 2 centigrams. It has been found by experience that young children, especially those nursed by their mothers, do better at home than when removed to hospital.

C. M. W.

WAHED (A. K. M. Abdul). **A Few Practical Points in Kala-Azar.**—*Indian Med. Rec.* 1924. Dec. Vol. 44. No. 12. pp. 358–362.

The paper is the result of observations on over 1,000 cases of kala azar. The difficulty of diagnosing the disease from purely clinical signs, especially the type of fever, is emphasized. The failure of response to quinine is most important for excluding malaria. The author does not believe that autoclaving the solution of antimony tartrate increases its toxicity. On the other hand, from experience gained by 30,000 injections he finds that the use of an autoclaved solution never produces any serious symptoms. He has been accustomed to use a 4 per cent. solution of the drug, giving $\frac{1}{4}$ to 2 cc. for a dose. Mention is made of the cough and pains in the joints which sometimes follow these injections, but though distressing they quickly pass off. It is found that the difference between slow and rapid injection of the dose is negligible. If the patient suffers from bronchitis it is better to treat this condition with expectorants before commencing injections of tartar emetic. High fever, dysentery and diarrhoea do not contraindicate the drug. Other complications such as cancrum oris, skin diseases and oedema may supervene during antimony treatment, and each requires its own special line of treatment. A type of case which used to be termed the "lymphatic type" and is now known as the "thymic type" tolerates antimony treatment badly. Unless the anaemic condition of these cases can be dealt with there is little chance of succeeding with antimony injections.

C. M. W.

BASU (Indubhusan). **Analysis of 50 Clinically Diagnosed Kala-Azar Cases treated in the Out-Patient Department of Carmichael Medical College Hospitals.**—*Calcutta Med. Jl.* 1924. May. Vol. 18. No. 11. pp. 745–752. With 3 charts.

The paper describes the observations and treatment of the cases of kala azar mentioned in the title. The aldehyde test was positive in 33 and leishmania were discovered by liver puncture in 23 cases. It is stated that some of the cases showed considerable improvement and were even cured by intramuscular injections of quinine, but the evidence produced that these cases were actually ones of kala azar or that the cure claimed had really taken place is far from convincing.

C. M. W.

BASU (Sudhir Chandra). **A Note on an Epidemic of Kala-Azar with Typhoid-like Onset and Simultaneous Occurrence in Several Families in a Village in Bengal, including Short Reports of a Few apparently Similar Epidemics of Fever in some other Villages.**—*Calcutta Med. Jl.* 1924. Aug. Vol. 19. No. 2. pp. 58–72.

In Bahiria, a village of Bengal, shortly after a case of kala azar in a girl of 9 years of age was noted, an epidemic of a febrile disease suddenly appeared. About the middle of the first week in May a girl of 7 years of age was laid up with fever. The girl was sister to two boys who had been treated and cured of kala azar, one of them 12 years before. Within 3 days of the onset of her illness one of the brothers, aged 18 also felt ill, and 4 days later the other one, aged 20. Almost simultaneously the disease spread to other families, so that in the course of 10–15 days all the families living within a limited area of the village were affected. Some of the families had 3 to 5 cases. The area of the village in which the outbreak occurred was separated from the rest of the village and had 100 inhabitants in 25 families. All the 25 houses were involved except two which were occupied by single individuals. In all 52 persons suffered from the disease, but there was only one death, and this on the 40th day of illness. The fever from which the patients suffered was of the continued type, while diarrhoea and dysentery were commonly present. The spleen was not markedly enlarged. It could not be felt in 30 of the cases. As regards the diagnosis, typhoid fever and malaria were excluded. Spleen puncture in one case was carried out and leishmania were found. Treatment with antimony tartrate was then instituted in the village, with the result that the outbreak was controlled. The positive diagnosis in one case and the response of all to antimony treatment after failure of quinine leads the author to conclude that the epidemic of a disease with typhoid-like onset was one of kala azar. Mention is made of other villages in which similar epidemics have occurred.

C. M. W.

DUTT (Madan Mohan). **Certain Observations on Cases of Enlarged Spleen as met with in Bengal.**—*Calcutta Med. Jl.* 1924. June. Vol. 18. No. 12. pp. 789–793.

Attention is drawn to the occurrence in endemic centres of kala azar of cases of splenomegaly which are neither kala azar nor malaria, so that the custom of diagnosing as kala azar all cases of enlargement of the spleen which do not respond to quinine is erroneous. About 5 to 7 per cent. of the cases are splenomedullary leukaemia, while many of the kala azar cases are so atypical that apart from discovery of the parasite diagnosis is extremely difficult.

C. M. W.

WOLTRING (F. J. L.) & HULK (J. F.). **Een geval van kala-azar.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 30. Year 68. 2nd Half. No. 9. pp. 1096–1112. With 5 figs. [17 refs.]

The paper describes a case of kala azar in an adult who returned to Holland from Pekin. As the patient had spent much time in the Dutch East Indies the authors take the opportunity of pointing out that the record of cases occurring endemically in those islands as made by DE

RAADT (1909), ELDERS (1909), NEEB (1909) and SMITS (1916) are unreliable. There appears to be only one authentic case on record, namely, that of NEEB (1920), and this was imported (this *Bulletin*, Vol. 20, p. 875).

C. M. W.

LÉVY (P. P.). **Sur l'hématologie du Kala-Azar infantile (à propos d'un cas observé à Paris et terminé par la guérison).**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 477–482. With 2 charts in text. [7 refs.]

A study of the blood of a case of kala azar which was successfully treated with injections of stibenyl (this *Bulletin*, Vol. 20, p. 571)showed that the red blood corpuscles, haemoglobin and leucocytes, which revealed the usual mononuclear increase, gradually returned to their normal proportions as improvement occurred.

C. M. W.

NAPIER (L. E.). **The Problem of Cure in Kala-Azar.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 492–504. [6 refs.]

The question of the amount of antimony tartrate necessary to bring about a cure in kala azar and the criterion of cure have occupied the author's attention in previous papers. Various rules as to the amount of drug required have been formulated, but the subsequent relapse of cases which had been treated has proved that the rules were unreliable. Similarly, the view that with apparent return to perfect health accompanied by failure to cultivate parasites from the liver or spleen a cure had resulted has been found to be fallacious, for certain cases which passed these tests have relapsed, while others from which positive cultures were obtained have without further treatment recovered. With the object of obtaining more precise data the author has analysed the records of 153 properly diagnosed cases of kala azar which were treated at the Hospital for Tropical Diseases in Calcutta, and the present paper describes the results obtained. It is concluded that there are no absolute criteria of cure, the only satisfactory evidence being the subsequent history of the patient. Some cases are definitely resistant to the antimony tartrate treatment, and therefore do not come within any rules which can be laid down for the treatment of ordinary cases, in which the maximum total dose of sodium or potassium antimony tartrate necessary to effect a cure is 4 grammes per 100 lbs. of body weight. If there has been decided increase in weight, reduction of the spleen to the level of the costal margin or a reduction of 4 inches in cases of very marked splenic enlargement and increase in the white blood count to over 6,000, the case should receive 30 injections (2·55 grammes) if the temperature falls to normal by the 7th injection, 35 if the fall in temperature does not occur till the 10th injection, 40 if the temperature falls at the 16th injection, and the complete course of 45 injections or more if the temperature persists longer than this. The Anglo-Indian appears to be more resistant to treatment than the Indian or even European. Previous irregular treatment appears to encourage resistance, whereas relapsed cases do not show this resistance. The disease appears to be equally amenable to treatment at all its stages.

C. M. W.

BRAHMACHARI (U. N.) & SEN (Parimal Bikas). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part X. Further Observations on Quantitative Studies in Excretion of Antimony. The Influence of the Basic Radicle and of Repeated Injections of an Antimonyl Tartrate upon the Excretion of Antimony.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 113–126. With 2 charts.

The rate of excretion of antimony from the body in the urine was tested after the administration of single doses of various salts—tartar emetic, sodium antimonyl tartrate, lithium antimonyl tartrate, ammonium antinomyl tartrate, and urea antimonyl tartrate. The order of excretion during the first 24 hours is: 1. Lithium salt, urea salt. 2. Sodium salt, ammonium salt. 3. Potassium salt. The same order is followed when the observation is extended to 7 days. The order is not entirely due to their solubility, for the diuretic action of the lithium and urea salts has to be considered. When repeated injections of antimony are made, on the assumption that the total quantity given, less the amount excreted by the kidneys, represents the amount present in the tissues, it is found that the amount excreted by the kidneys is fairly proportional to the amount present in the tissues up to a limit. If the quantity present in the tissues is greater than this then the proportion excreted by the kidneys becomes greater. The limit is termed the maximum concentration in the tissues. It would thus appear that excessive concentration of the drug in the tissues is prevented by the power the kidney possesses of increasing its rate of excretion. It was found from an examination of different organs that the greatest concentration of antimony occurred in the liver. The data from which these rules have been adduced are presented in a series of tables and charts.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XI. The Value of Urea Stibamine in the Treatment of Early Kala-Azar.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 397–402.

A series of 11 cases of early kala azar were treated with urea stibamine. The total quantity of drug given varied from 0·2 to 0·9 gram and the number of injections from 2 to 8. The disease was cut short in a remarkable manner in all the cases. A series of cases treated by SHORTT and FOSTER with similar results is also referred to.

C. M. W.

BRAHMACHARI (U. N.) & DAS (Judhistir). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XII. Some Observations on the Constitution of Urea Stibamine and Stibamine.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 423–426. [2 refs.]

When urea-stibamine was first described in 1922 it was regarded as a salt of urea and *p*-aminophenylstibinic acid, having the empirical composition $C_7H_{12}O_4N_3Sb$. Further analyses show that this formula is correct with the exception that the material contains in addition a molecule of water. Study of the reactions of the substance, however,

indicates that it is not a simple salt of the two components as originally supposed, and it is now suggested that in its preparation (which is not described, but appears to involve the heating of urea with *p*-aminophenylstibinic acid) the urea undergoes at least momentary reversion to ammonium cyanate, which then dissociates, the ammonium radicle joining with a hydroxyl group of the stibinic acid residue, while the cyanic acid radicle attaches itself to what was the amino-group of the *p*-aminophenylstibinic acid.

$$\underset{\textit{Urea}}{NH_2\text{-}CO\text{-}NH_2} \text{ on heating} \longrightarrow NH_3 + HNCO \longrightarrow NH_3 + HO.CN.$$

$$\underset{\textit{Transformed urea}}{NH_3 + HO.CN} + \underset{\text{p-}\textit{Aminophenylstibinic acid}}{NH_2.C_6H_4.SbO\,(OH)_2} =$$

$$\underset{\textit{Urea-stibamine.}}{NH_2.CO.NH.C_6H_4.SbO\ (OH)\ (NH_4)}$$

Organic chemists will be interested in these singular reactions.

Stibamine, which is the sodium salt of *p*-aminophenylstibinic acid, is now shown to have the trimolecular formula, less two molecules of water, but the authors' attempts to write it correctly are not successful. Urea-stibamine (*see above*) and sodium glycyl-*p*-aminophenylstibinate (which it may be explained is amino-stibacetin) do not polymerize.

T. A. Henry.

SHORTT (H. E.) & SEN (Ram Taran). **Final Report on the Use of Urea Stibamine in Kala-Azar.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 335–338.

The authors describe their treatment of a further series of 20 cases of kala azar with urea stibamine. The method of treatment was the same as that previously described (this *Bulletin*, Vol. 21, p. 254). The average duration of treatment in the 20 cases was 23 days and the average total quantity of drug given 2·6 grams. One case specially mentioned was in a condition of extreme cachexia, the spleen being the most prominent the authors have seen and containing extremely numerous parasites. The patient had already received 1,000 cc. of 1 per cent. sodium antimony tartrate and had progressively deteriorated. He was treated with urea stibamine and received 8·1 grams before sterilization was effected. Another case was treated with intramuscular injections of urea stibamine alone. Very slight pain was complained of, the case being cured by 12 injections (2·7 grams) in the course of 23 days. The authors consider that urea stibamine has been established as the most efficient drug at present in use for the treatment of Indian kala azar. The details of the 20 cases are set out in tabular form.

C. M. W.

FOSTER (Percy). **Urea-Stibamine in the Treatment of Kala-Azar under Tea Garden Conditions.**—*Proc. Assam. Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 24–26. *& Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 391–393. [3 refs.]

As all the cases of kala azar hitherto reported as being cured by urea stibamine had been in hospital under the best conditions, the

author was requested to try the drug under ordinary tea garden conditions in Assam. Twenty cases have been treated. The number of injections varied from 4 to 21 and the total quantity of drug from 0·35 to 3·20 gm. Of these cases one died from pulmonary complications, but all the others appear to have been cured. The doses used were mostly those recommended by SHORTT, but individual variations were made (this *Bulletin*, Vol. 21, p. 254).

C. M. W.

PRICE (J. Dodds). **Cases of Kala-Azar showing little or no Improvement with Sodium Antimony Tartrate, subsequently cured by Urea Stibamine.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 464–466.

The paper is based on experiences in the treatment of 8 cases of kala azar. The author still treats the majority of his cases with sodium antimony tartrate, but strongly urges that urea stibamine should be resorted to if after a few injections of antimony tartrate a patient shows no marked improvement. In addition to the 8 cases, 15 others have been treated with urea stibamine. No dramatic cures have been noted after 5 or 6 injections, the average number required being 14.

C. M. W.

ARCOLEO (Gaetano). **Ein Fall von Kala-azar bei einem Muselmann, der mit "Bayer 205" geheilt wurde.** [A Case of Kala Azar in a Mussulman successfully treated with "Bayer 205."]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. pp. 295–297.

A native of Tripoli suffering from kala azar diagnosed by spleen puncture was successfully treated with "Bayer 205." The patient was given five weekly doses of 0·1, 0·3, 0·5, 0·5, 0·6 gram of the drug. There were no symptoms of intolerance and within three days of the last injection the patient appeared to have made a complete recovery. Seen two months later, he was in perfect health.

C. M. W.

SIA (Richard H. P.). **A Simple Method for estimating Quantitative Differences in the Globulin Precipitation Test in Kala-Azar.**—*China Med. Jl.* 1924. Jan. Vol. 38. No. 1. pp. 35–42. With 2 figs. [2 refs.]

A method has been devised for making a quantitative estimation of the globulin precipitation from kala azar blood. In a small test tube 20 cc. of blood are quickly mixed with 0·6 cc. of distilled water. Without further agitation the mixture is allowed to stand. If there is a sediment the reaction is regarded as strongly, moderately or weakly positive according as the time required is 15, 30 or 60 minutes. If after one hour there is no sediment, but only a fine precipitate, it is very weakly positive, while a doubtful positive is represented by a haziness only in one hour. In treated cases of kala azar with improvement there is a change in the reaction which follows the above order.

C. M. W.

RAY (Charu Brata). **The Globulin Content of the Serum in Kala-Azar.** —*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 387–391. With 1 fig. [4 refs.]

In normal serum there are two principal varieties of globulin, euglobulin and paraglobulin. Of these the former, being insoluble in water, is supposed to be the true globulin and the latter pseudoglobulin, which is soluble in water. It has been found that there are two varieties of pseudoglobulin which are precipitated at different concentrations of salt. The details of the technique which gave these results are described. In kala azar, though the amount of serum proteids does not vary much from normal, the globulins are much increased, and this has special reference to the euglobulins. In normal serum euglobulin constitutes 7 to 8 per cent. of the total globulin, while in kala azar it is 40 to 50 per cent. This substance being insoluble in distilled water appears to be responsible for all the different blood tests in kala azar.

C. M. W.

AURICCHIO (Luigi). **Ricerche sulla glicemia nella leishmaniosi infantile.**—*Pediatria.* 1924. June 15. Vol. 32. No. 12. pp. 704–711. [5 refs.]

The sugar content of the blood was estimated in 12 healthy children, 5 of whom had been cured of kala azar, and 23 children suffering from the disease. In the healthy children the estimation gave figures varying from 0·091 per cent. to 0·108 per cent. with an average of 0·101 per cent. In the others it varied from 0·112 per cent. to 0·201 per cent. with an average of 0·142 per cent. It is evident that in kala azar the sugar content of the blood is increased, and this is attributed to the disturbance of the liver function caused by the disease.

C. M. W.

WAGENER (Edna Hannibal). **A Skin Reaction to Extracts of** *Leishmania tropica* **and** *Leishmania infantum.*—*Univ. California Public. Zool.* 1923. Dec. 31. Vol. 20. No. 22. pp. 477–488. With 1 plate. [14 refs.]

Rabbits were immunized by injecting intravenously suspensions of *L. tropica* and *L. donovani* obtained by diluting the deposit from centrifuged culture washings till each cubic centimetre contained one and a-half million organisms. The rabbits received 2 cc. of the suspension at 3-day intervals. Seven days after the last injection it was found that the serum contained specific agglutinins which gave complete agglutination of the homologous organism in dilutions of 1/980. A leishmaniosin, prepared by the technique of FORCE and STEVENS, was dissolved by grinding in a mortar with a weakly alkaline solution such as Coca's fluid, covered with toluol and allowed to stand at room temperature for 3 days. Similarly, the centrifuged deposit from cultures was diluted with Coca's fluid (sodium chloride 0·5 gram, sodium bicarbonate 0·05 gram, carbolic acid 0·4 gram, distilled water 100 cc.) till 1 cc. contained 2,000,000 organisms. This was covered with toluol and allowed to stand as in the case of the first extract. Normal and immune rabbits were tested by the injection of 0·2 cc. of these solutions into the skin. It was found that the immunized animals reacted. At the end of 24 hours in the cases of the second

solution there was a small reddened papule which reached its height in 48 hours and persisted for 5 days. The centre of the papule consisted of an ivory white area 1 to 2 mm. in diameter. It was surrounded by an irregularly-shaped red halo. With the first solution the reaction differed little from that in control animals which reacted only in the appearance of a slightly indurated papule devoid of the white centre. The skin reaction was not specfic in that it was given by both organiams in the one animal.

C. M. W.

SHORTT (H. E.) & SWAMINATH (C. S.). **The Behaviour of Cultures of** *Herpetomonas donovani* **in Bed Bugs,** *Cimex lectularius* **Linn. and** *Cimex hemiptera* **Fabr.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 391–396. With 3 plates. [6 refs.]

CORNWALL and his collaborators have described in detail the behaviour of cultural forms of *L. donovani* in bed bugs which were undoubtedly *C. hemiptera*=*C. rotundatus* (this *Bulletin*, Vol. 19, p. 304). The authors decided to repeat the experiments by using the two species *C. lectularius* and *C. hemiptera* side by side. The former does not occur in the kala azar areas in Assam. As in CORNWALL's experiments, bugs were made to ingest cultures of the organism. In the main a confirmation of the previous results was obtained, but it was found that certain differences occurred between the two bugs and that these probably depend upon the fact that digestion of blood proceeds more rapidly in *C. hemiptera* than in *C. lectularius*. The greatest concentration of flagellates in the stomach is seen on the 6th or 7th day. In the case of *C. lectularius* intense concentration of flagellates is the rule, the midgut being filled with a seething mass of flagellates, well illustrated in the excellent figures of sections of this organ. This is partly due to multiplication, but the rapid absorption of fluid from the midgut is also responsible for the result. In *C. hemiptera* such concentrations were not seen. Furthermore, with less active digestion *C. lectularius* on an average retains its infection longer than *C. hemiptera*. Passage of the flagellates to the posterior narrow portion of the midgut occurs early in *C. hemiptera*. In *C. lectularius* it does not occur till the 2nd or 3rd day. The formation of the thick tails occurs less frequently in *C. hemiptera*. At no stage was any trace of an intracellular phase noted.

C. M. W.

ADELHEIM (R.). **Ueber Leishmaniosis infantum et canina in Riga.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Sept. Vol. 28. No. 9. pp. 367–387. [38 refs.]

Three months after the return of a Russian family from Turkestan to Riga it was found that a five-year-old daughter and a dog which had been brought back were suffering from kala azar. The virus from the dog was employed for experimental purposes. Mice, rabbits and guineapigs were inoculated subcutaneously. Only a certain number of the mice became infected. The disease in them lasted about six months and was usually fatal, though in some cases recovery occurred. The liver and spleen of the infected animals contained enormous numbers of parasites, while in two of 10 mice inoculated subcutaneously a local sore developed at the site of the inoculations

and in them leishmania were demonstrated. In some cases the local sore with its parasites persisted while the generalized infection disappeared. An interesting observation was made on a healthy mouse which was kept in a jar for five months with an infected one. Both animals when killed were found to have numerous parasites in the spleen and liver. It is presumed that an oral infection had taken place as in many of the infected mice intestinal ulcers occurred in which leishmania were demonstrated.

C. M. W.

i. YOUNG (T. C. McCombie). **Fourteen Years' Experience with Kala-Azar Work in Assam.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 81–97. With 6 figs & 2 maps. [6 refs.] (Discussion pp. 98–107.)

ii. SOULIÉ (H.). **Sixième cas de kala-azar en Algérie.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 778–784. With 2 figs. [19 refs.]

iii. SABATINI (Luigi). **Caso di leishmaniosi infantile in Liguria.**—*Pediatria.* 1924. July 1. Vol. 32. No. 13. pp. 794–797.

iv. KASUGA (Kenzo). **A New Culture Medium for** *Leishmania Donovani.*—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore.* 1923. pp. 698–699. With 3 figs.

i. An abstract of the author's book on kala azar in Assam which has been reviewed in Vol. 21, p. 998, of this *Bulletin.*

ii. A description of the sixth case of infantile kala azar observed in Algeria, together with notes on the 5 cases previously recorded.

iii. Description of a case of infantile kala azar at San Remo.

iv. Till the author has satisfied himself that *Leishmania donovani* will grow in N.N.N. medium, which he seems to doubt, it is evident that the more complicated medium which he has found to be only fairly satisfactory need not be considered.

C. M. W.

AVARI (Khan Bahadur C. R.) & MACKIE (F. P.). **Canine Leishmaniasis in Bombay.**—*Indian Med. Gaz.* 1924. Dec. Vol. 59. No. 12. pp. 604–605. With 1 fig. in text.

A pariah dog living near the Bacteriological Laboratory in Bombay was noted to have a superficial ulcer near the base of one of its ears. An examination of scrapings revealed leishmania. The authors also examined films made from a sore in a dog which were sent to them from the Punjab. In these also leishmania occurred. These two instances are the only ones in which natural leishmania infection of dogs in India have been observed.

C. M. W.

ROW (R.). **On Some Pathological Observations in Experimental Leishmaniasis in Mice with Special Reference to Generalised Infections set up by** *Leishmania tropica.*—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 435–438. With 2 figs. [7 refs.]

In a previous paper (this *Bulletin,* Vol. 5, p. 260) the author described generalized infection in mice resulting from inoculation with *Leishmania tropica.* Other observers, particularly GONDER and LAVERAN, have noted similar infections, but have described

cutaneous lesions which occurred in association with the infection of the internal organs. As the author did not observe these cutaneous lesions he has repeated his previous experiments. Mice were inoculated with cultures of *L. tropica* obtained from a Cambay sore and other mice were subinoculated from the spleen of those already infected. The result has been that again generalized infections without cutaneous lesions were produced. They differed in no way from those resulting from *L. donovani*. A search for parasites in the intestine revealed them only in situations where lymphoid tissue occurred.

C. M. W.

TORRES (C. B. Magarínos) & LEÃO (A. E. de Arêa). **Leishmaniose e Blastomycose. (Observação de um caso de associação das duas molestias).**—*Sciencia Medica.* 1924. May 31. Vol. 2. No. 5. pp. 256–259. With 8 figs.

The case described was one of cutaneous leishmaniasis which was first seen with ulcerations on the nose, lips and neck. Tartar emetic treatment was commenced, and as the ulcers appeared to be healing the patient left the hospital after the sixth injection. He returned three months later with the disease in an aggravated condition. In addition to the original lesions there were others on the limbs and front and back of the thorax. It was found that the infection was a mixed one of leishmaniasis and blastomycosis. Tartar emetic produced severe reaction. Under arsenical treatment (914) and iodide of potassium the patient did not improve, and he finally died in a condition of extreme cachexia.

C. M. W.

CASTELLANI (Aldo). **Further Observations on the Treatment of Oriental Sore by Means of Phosphorus.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 1. Vol. 27. No. 19. pp. 263–264. [2 refs.]

The paper describes the successful treatment of 3 cases of oriental sore with phosphorated oil (this *Bulletin*, Vol. 20, p. 874). In one case 3 minims were injected into the skin ½ to 2 inches outside the nodule twice a week. The lesion disappeared in 6 weeks. In the second case injections were made into a nodular lesion twice a week for a fortnight while external applications of the oil were also made. There was severe reaction, so the oil treatment was discontinued. Hot fomentations were also used for the next 3 weeks. Healing was complete in this time. The third case was cured in a fortnight by application of oil to the sore every second day.

C. M. W.

KELAART (H. van Geyzel). **Brief Note on a Persistent Case of Oriental Sore of the Face, successfully treated by Phosphorated Oil. (Castellani's Method.)**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 1. Vol. 27. No. 21. p. 288. [3 refs.]

A record of an obstinate case of an oriental sore which had persisted for 18 months in spite of 3 prolonged courses of treatment with tartar

emetic injections. Cure was brought about in 2 weeks by the application to the sore on alternate days of phosphorated oil. This case appears to be one of three referred to by CASTELLANI and noted above.

C. M. W.

SINDERSON (H. C.). **Emetine Hydrochloride in the Treatment of Oriental Sore.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 108-110.

The author has had very good results with the treatment of 22 cases of oriental sore by injecting a 5 per cent. solution of emetine into the bases and thickened margins of the sores. The cases supplied in all 64 sores, 2 of them having 21 sores between them. Not more than 20 minims of the solution was used at any one time and this quantity may be made to do for 3 sores. If there are more than 3 sores, two or three are treated at one sitting, the others later. Three or four days after the injection the sores become well-defined ulcers which, with ordinary surgical dressings, heal in about a fortnight. The after-histories of 16 of the 22 cases were traced. These represented 48 sores, which in only 5 instances showed any suspicion of recurrence after two months.

C. M. W.

i. DANEL (L.). **Boutons d'Orient multiples.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 562–564.

ii. DEKESTER (M.) & MELNOTTE (P.). **Premier cas de leishmaniose cutanée observé chez un indigène au Maroc en dehors des zones sahariennes.**—*Ibid.* pp. 565–568. With 1 text fig.

iii. SERGENT (Et.). & GUEIDON (E.). **Chronique du bouton d'Orient en Algérie. Nouveaux cas sur le littoral (Clou de Mila).**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 181–182.

iv. MARIANI (Giuseppe). **Il primo caso di leishmaniosi cutanea autoctona nella provincia di Cagliari.**—*Giorn. Ital. d. Malat. Ven. e d. Pelle.* 1924. Oct. Vol. 65. Year 59. No. 5. pp. 1581–1604. With 2 plates & 1 text fig. [32 refs.]

v. GONZÁLEZ RINCONES (R.). **La leishmaniosis en Venezuela.**—*Cronica Med.-Quirurg. Habana.* 1924. Jan. & Mar. Vol. 50. No. 1, 2 & 3. pp. 19–29. With 26 figs.

vi. MARZINOWSKY (E. I.) & SCHURENKOWA (A.). **Oriental Sore and Immunity against it.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 67–69.

i. Description of a case of oriental sore in a Russian from Bushire.

ii. The title sufficiently explains the subject of this paper.

iii. In a previous paper the authors showed that a disease which had long been known as "Clou de Mila" was oriental sore. The present paper gives an account of 4 further cases from the same district.

iv. An account of a case of oriental sore in Sardinia together with a detailed description of the histopathology of the lesion.

v. A description of a series of cases of cutaneous leishmaniasis and the occurrence of flagellates, probably crithidia, in various plant bugs.

vi. This paper is the same as that reviewed in this *Bulletin*, Vol. 21, p. 726.

C. M. W.

BANERJI (Dhirendranath). **Kala Azar.**—*Calcutta Med. Jl.* 1923. Jan. Vol. 17. No. 7. pp. 7–42.

BRAHMACHARI (U. N.). **Toxicity of Some Antimonial Compounds and their Value in the Treatment of Kala-Azar.**—*Ibid.* pp. 1-5.

GHOSH (Raj Harinath). **Kala Azar. Introductory Remarks.**—*Calcutta Med. Jl. Ibid.* pp. i–viii.

NAPIER (L. E.). **Musings on the Problem of the Transmission of Kala Azar.**—*Ibid.* pp. 6–6b.

PERRY (H. Marrian). **Some Observations on the Occurrence of** *Leishmania* **in the Intestinal Tissues in Indian Kala-Azar : on the Pathological Changes occasioned by their Presence, and on their Possible Significance in this Situation.**—*Proc. Roy. Soc. Med.* (*Sect. of Trop. Dis. & Parasit.*). 1923. Feb. Vol. 16. No. 4. pp. 1–8. With 3 text figures.

LEPROSY.

ROGERS (Leonard). **The Croonian Lectures on Leprosy Researches.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 267–322. With 2 figs.

The first of these lectures is devoted to a general survey of the distribution of leprosy and of the factors influencing its spread, based on a consideration of previous records and the history of the disease. An attempt is made to show the correlation of inverse ratio between the prevalence of leprosy and tuberculization as evidenced by the von Pirquet test. The fallacies attendant on the interpretation of figures of prevalence are next pointed out, the text of the discourse being the apparent decline of leprosy in British India during the last 50 years.

Lecture II deals with the mode of infection and prophylaxis. The various ways in which the bacillus may gain entrance according to the views which have been put forward from time to time are briefly referred to, together with the possible effect of humidity in relation to leprosy, details of which have been given in previous papers by the author and reviewed in this *Bulletin* (see Vol. 20, p. 821).

Methods of prophylaxis as carried out in different countries, cold, temperate, and tropical, are mentioned, with statistical figures for each, and reasons for the failure of these methods, which consist mainly of segregation, are stated; the chief appear to be vacillating policy and defective administration. Measures to be adequate must include compulsory notification, isolation or institutional segregation ot patients, examination of contacts at regular intervals, removal of children from their parents as soon after birth as possible, separation of the sexes in institutions, prohibition of lepers from engaging in the preparation and sale of food, in nursing and domestic employment, and, most important of all, treatment, thorough and early if possible.

From the point of view of the tropical worker the third lecture, on Treatment, will probably be of paramount interest. Previous modes of treatment by serums, vaccines, mineral preparations, and so on, are briefly reviewed, the remainder of the lecture being concerned mainly with chaulmoogra oil and its derivatives. The difficulties of estimating the effects of treatment are duly stressed, namely, the intermittent improvements which may take place spontaneously, and the comparatively sudden exacerbations arising in a disease with, typically, a chronic course; also the improvement in ill-nourished patients when placed under a good régime and properly cared for, even when no drugs are given. An interesting historical account of the use of chaulmoogra precedes a discussion of its various preparations and modes of administration.

Sodium gynocardate intramuscularly was found to be better borne by Indian patients than the whole oil, but preparations containing both gynocardic and hydnocarpic acids, injected intravenously, gave much better results. The author shows how, without any reaction noticeable to the patient, the bacilli may be broken down and the nodules absorbed, till, finally, bacilli are no longer detected either in the tissues or in the nasal mucus, so that in a case of average severity the patient became free of symptoms and infectivity in 6–18 months. Exceptionally, prolonged improvement may follow injection of a

single small dose of the drug, e.g., 0·2 cc. of a 3 per cent. solution, but to ensure good results it is necessary in most cases to continue treatment regularly after clearing of symptoms and better for 12–18 months.

An account is given of the development of the idea that it is the unsaturated fatty acids which constitute the chief factor influencing the therapeutic value of oils in leprosy, so that many other oils besides that of chaulmoogra may prove beneficial in this disease. Although such good results were obtained by intravenous administration of the drug, the method has the disadvantage of leading to obliteration of the vein by its local irritant action. The results obtained by Professor DEAN, of Honolulu, and others with the ethyl esters from chaulmoogra also receive mention, but the author does not record any experiences of his own with these. They have the advantage of causing little or no pain when injected intramuscularly and are, therefore, more convenient for administration than irritating preparations intravenously.

The final pages of the lecture deal with results of treatment by ethyl chaulmoograte and hydnocarpates statistically compiled, showing that the degree of improvement depends largely upon the duration of the disease and the length of treatment. Thus, in Honolulu, of cases of less than 6 months' standing, 44 per cent. are stated to have recovered, but only 3 per cent. of those who had suffered for 8–10 years, while, as showing the influence of prolonged treatment, the percentage of those improved after 3 months' treatment or less was 26, but of those who submitted to 12–15 months' treatment 93 per cent. showed improvement. Finally, the question is asked: "Can lasting cures be obtained?" The author concludes that the outlook is hopeful, provided treatment is undertaken sufficiently early and continued sufficiently long. Most early and some more advanced cases lose all symptoms, and one patient has "remained free for over eight years from all signs of the disease . . . although he has had no treatment during the last three years."

H. Harold Scott.

IIIe Conférence Internationale de la lèpre, Strasbourg—28 au 31 juillet 1923. Communications et débats recueillis et colligés par le Dr. E. MARCHOUX.—528 pp. With 1 plate & 89 figs. 1924. Paris: Librairie J. B. Baillière et fils, 19, rue Hautefeuille.

This handsome volume of 528 large pages appeared late in 1924; much of its information has already appeared elsewhere, and been referred to in this *Bulletin*, so that only a brief summary of its more important items need be given here.

After opening speeches a sitting was devoted to statistics on the incidence of leprosy in various parts of the world, which brought out little new. It indicates a further decline of the disease in the Maritime Alpes, Norway, Sweden and the Baltic Provinces, States of Livonia and Esthonia, largely due to the death of a number of lepers during the war in the last mentioned area. In Russia the present numbers are quite unknown; in Japan leprosy is said to be decreasing yearly as the result of prophylactic measures, the number known being placed at 16,261 in 1919, which is far less than some earlier estimates; in Brazil 7,224 cases were registered in 1921, but there are many unknown

cases. A number of the French tropical colonies, particularly Cameroun, are severely infected, the sum total being estimated at 80,000. The Belgian Congo is infected throughout with unknown numbers.

Etiology was dealt with at the second sitting, which opened with a paper on the relation of leprosy to humidity by L. ROGERS (this *Bulletin*, Vol. 20, p. 821). Then followed an important paper by the Secretary of the Congress, M. E. MARCHOUX, on rat leprosy and its transmission to man, in which he showed that the bacillus is rapidly killed by drying or by a temperature of 60°C., cannot be cultivated, and is as essentially parasitic as the human form, while it can readily be inoculated through a slight abrasion of the skin, or even through epilation ; these observations strongly suggesting a similar mode of infection in human leprosy, through close association with an infective leper. The bacilli in both forms may also remain long latent in lymphatic glands, the organism being anaerobic according to this worker. The vexed question of the cultivation of the lepra bacillus was inconclusively discussed by KEDROWSKY and others, and Professor STANZIALE spoke on his well-known work on inoculation of rabbits' eyes with leprous material. A. PALDROCK of Dorpat described branching lepra bacilli containing acid granular bodies, which he considered to be reproductive elements, but MARCHOUX pointed to the low resisting power of the organism as opposed to this theory.

The third sitting, devoted to the comparative pathology of leprosy, began with an interesting paper by MARCHOUX on the progress of the infection in which he showed the close similarity with tuberculosis. Latent leprosy with spontaneous cures is believed not to be rare, and concomitant infections may favour the development of active leprosy, as has also been shown by MUIR, whose paper on the nomenclature of leprosy follows. The disease is divided into quiescent, inflammatory and resolving phases of activity applicable to all cases, and into dermal, including nodular and diffuse varieties, and nervous, either of ascending or metastatic distribution.

A number of clinical papers follow, the most interesting being J. DARIER's on tuberculoid lesions closely resembling those of lupus, containing extremely few bacilli and occasional giant cells and showing alterations in sensibility. [Similar cases have been described by MUIR in India, where they are common.] Professor JEANSELME, the President, and others, discussed the pigmentary, and M. HIRSCHBERG the bony changes in leprosy, while Professor G. H. MONRAD-KROHN of Christiania dealt with the neurological aspect on the lines of his recent book. K. MITSUDA of Japan describes a reaction at the site of injection into the skin of an emulsion of a fresh leprous tubercle broken up and boiled for two hours in water and diluted to contain 1 gramme in 10 cc. of 0·5 carbolic acid, the dose being 0·05 cc. In 403 lepers a hyperaemic reaction appeared at the end of 48 hours, which disappeared completely in a few days in nodular cases, but in 79 per cent. of macular and nerve cases it increased up to 15 days to form a papular infiltration lasting for over a week. In old persons not associated with lepers and in a healthy attendant (for twenty years) on lepers similar prolonged reactions were met with, and MITSUDA considers that healthy attendants should be thus inoculated to increase their resistance, as the slight short reactions in nodular lepers are thought to be a sign of absence of any resistance. The same worker discussed the question of the curability of leprosy, pointing out that though there is a tendency for the less resistant macular cases to become nodular and the more resistant

to develop into the nerve form, all forms may disappear sooner or later and some cases clear up completely. The Bordet-Wassermann reaction in leprosy was next discussed without much result, and Dr. M. GUILLEN described a particular albuminous reaction as diagnostic of leprosy. The same worker, after pointing out that successful treatment depends on early diagnosis, describes the first symptoms in order of frequency as (1) nervous symptoms of pain, atrophy or anaesthesia; (2) affections of the skin of the face and extremities and (3) obstruction and the formation of crusts in the nose.

An important section on Treatment brings out a very general consensus of opinion of the great value of the new methods of injecting the soluble products of chaulmoogra oil, especially in the form of the ethyl esters, while some remarkable results are also recorded by K. MITSUDA with the prolonged use of injections of chaulmoogra oil itself, a number of photos illustrating the results of such treatment continued in most advanced nodular cases for from two to five years being reproduced. R. F. PARRA and J. E. SANTOS, reporting on the extensive use of the esters in Colombia, tabulate 127 cases, the great majority of which, especially the nodular cases, showed improvement, though final conclusions regarding ultimate results must be awaited. E. RABELLO & I. VERNET of Brazil come to very similar conclusions, but add that ethyl chaulmoograte may also be used in prophylaxis. Dr. GOUZIEN, the head of the French Colonial Medical department, reported favourably on the use of the new methods by various French Colonial medical officers, but points out that great care is required in the case of leprosy complicated by tuberculosis. Papers by M. ROBINEAU and by L. ROGERS deal with methods which have already been reviewed in this *Bulletin*, as do those of H. GOUGEROT on injections of eparseno, which have not fulfilled the expectations aroused by the first reports, and of A. PALDROCK on the local application of carbonic acid snow. In the final resolutions the necessity of supplying the best treatment in all leper institutions was emphasized.

Prophylaxis provided some interesting papers. E. MARCHOUX, in discussing the mode of contagion, considered that latent unrecognized cases might be more dangerous than obvious ones, since they are not avoided. E. RABELLO & J. MOTTA report the great efforts now being made by the Brazil Government to deal with lepers in accordance with rules drawn up by Dr. C. CHAGAS in 1920, including compulsory notification and hospital or domiciliary isolation, the former preferably in agricultural colonies; marriage of lepers is permissible only under condition of the separation of any infants from birth, these measures being in accordance with the resolutions of the Rio de Janeiro leprosy commission of 1918; the Brazil Government has also made it obligatory on all medical students to be instructed regarding leprosy, an advance which should be introduced into all leprosy infected countries. The Government has voted 6,000,000 francs annually for the work, 1,823 of the 7,220 known lepers are already isolated, and six more colonies to accommodate 5,600 lepers are being arranged for; when these are completed Brazil will have set an example to other nations in her liberal provision for lepers. An American Leprosy Conference at Rio de Janeiro in October, 1922, recommended meetings every fourth year, and the formation of associations in each country to further prophylactic and research work on leprosy. An association for the help of lepers is being formed in Brazil.

Japan, in 1917, also made important advances in prophylaxis, as described by K. MITSUDA, arrangements being made to enlarge the

five leper hospitals to accommodate 4,500 patients, including the greater part of the contagious cases, as well as a hospital for the close study of 500 cases. The difficult question of the separation of the sexes has been carefully considered, the advisability of separation being weighed against the danger of formation of unnatural habits. During the last nine years 170 males have voluntarily submitted to vasectomy to prevent the procreation of children born to danger or misery, the fact that in progressive cases sterility ensues sooner or later as a result of the disease being cited in favour of this procedure. [The Americans have also adopted this wise measure in Panama.] Age figures show that 41 per cent. came to hospital by the age of 20 and 63 per cent. by 25, and 4 men were admitted to 1 woman, although the proportion in the whole country is 2½ to 1, while 58 per cent. were nodular, 31 per cent. anaesthetic, and 11 per cent. macular. The most frequent causes of death were pulmonary tuberculosis 28 per cent., nephritis 20 per cent., and pneumonia 5·6 per cent. In Cambodia C. Mathis says that the lepers there were recently officially estimated at 1,200 in a population of 2,500,000, and that nothing appreciable has yet been done to deal with the problem ; he advocates compulsory isolation of begging lepers. L. Rogers deals with the present position of prophylaxis in British Colonies, and shows that while compulsory segregation has been followed by considerable diminution in the number of known lepers in those West Indian Islands that enforced it, an increase took place in those which neglected the measure, while little has yet been done in our badly infected tropical African possessions, where the problem is a most difficult one. The African problem is also dealt with by M. Robineau in connexion with the badly infected Cameroons, where it is one of the chief medical problems, and there are now 578 lepers in three leprosaria, together with five villages containing 179 among 125,000 inhabitants in the Ebolowa division. The greatest difficulty is experienced in collecting the lepers, attempts to do so through the native chiefs or through guards failed completely ; the only successful plan is to send selected lepers in pairs touring through the infected villages, who explain the care taken of them in the settlements, with the result that they generally return within a week bringing 10 to 15 new lepers with them. H. C. de S. Araujo gives a long account of prophylaxis in Guiana and Trinidad, including an interesting description of the new Trinidad settlement on the Island of Chacachacare, which will be a great improvement on the Corcorite asylum in the suburbs of the capital of the colony.

The last section dealing with legislation opens with a paper by E. Marchoux, in which he pleads eloquently for abandoning the harsh measures of the middle ages, and for treating leprosy on similar lines to the closely allied tuberculosis, the latter being the more infectious and dangerous of the two. Hospitals and dispensaries within reach of the patients' friends should be provided in place of distant segregation, special attention being paid to early diagnosis and efficient treatment ; the marriage of lepers among themselves should not be forbidden as long as any offspring can be removed from their care, and the Norwegian mild isolation measures should be carried out, although under certain circumstances more severe measures may be necessary to deal with wandering lepers. For these purposes compulsory notification, with domiciliary isolation where practicable, and for others, especially indigents, comfortable leper homes, or, as

in Annam, a leper quarter in the villages. The isolated patients should be efficiently treated and provided with employment and amusements, and the people instructed in the precautions necessary to avoid infection from lepers. Other papers give the laws in Brazil and in Japan, and the report ends with the resolutions of the congress.

L. Rogers.

MARCHOUX (E.). **A Lepra em nossos dias. Etiologia-Prophylaxia.**—*Rev. Med.-Cirurg. do Brasil.* 1924. July. Vol. 32. No. 7. pp. 339–354. [3 refs.]

The first part of this paper might serve as an introduction to the bacteriology of leprosy. The second deals with rat-leprosy and points out analogies between it and the human disease. There are certain morphological differences in the organisms, notably the terminal swelling of the bacillus in the rat form; also it is readily inoculable and may be transmitted by flies direct, but not after an interval of more than 24 hours. There is no evidence of any insect vector in the true sense. Intraperitoneal inoculation produces extensive visceral lesions. In the rat, as in man, cases of latent leprosy occur, *i.e.*, infected individuals showing no clinical signs of the disease. Cases in which the leprous lesion is small may undergo spontaneous cure. Emulsion of the spleen pulp of a leper was injected into a rabbit, a guineapig and six rats. Five of the last became infected, but not the others. The question of the susceptibility of man to the rat form is not decided.

H. Harold Scott.

COOK (Cecil). **Leprosy in Australia.** [Correspondence.]—*Med. Jl. Australia.* 1924. Sept. 27. 11th Year. Vol. 2. No. 13. pp. 336–337.

The writer states that in spite of leprosy having been a notifiable and quarantinable disease for three decades it is still as prevalent as ever in some of the States. This he attributes to the early stages not being recognized or not reported by medical men, since in the case of a small outbreak among the natives at Roebourne, Western Australia, prompt isolation of the first four cases stamped out the disease, as should be possible in other places. In Queensland only cases found to be bacteriologically positive are isolated, but arrangements should be made to examine all cases at regular intervals to detect the early infective stage, while cases outside the lazarets should receive no regular treatment; as is not yet the case. Medical men should be taught to recognize early cases, and sanatoria-like conditions should be provided for lepers.

L. R.

PAGÉ (J. D.). **Leprosy in Canada.**—*Canadian Med. Assoc. Jl.* 1924. Sept. Vol. 14. No. 9. pp. 824–825.

Leprosy was first discovered in New Brunswick in 1815 and a lazaretto built at Tracadie in 1844, to which lepers were admitted later

from other parts of Canada, the Federal Government taking it over in 1869. A few years later the D'Arcy Island lazaretto was opened in British Columbia; it has recently been transferred to Bentinck Island, and now has nine patients, while Tracadie has ten, only four of whom now show active disease, the rest being mutilated quiescent cases. The average physician fails to recognize the early stages which may be a danger to others. The importance of early diagnosis cannot be too much emphasized, because if a leper is discovered within five years of his arrival in Canada be can be sent back to his native country, and because of "the marvellous results obtained of late years from the treatment with hypodermic injections of ethyl esters of chaulmoogra oil."

L. R.

HOFFMAN (Frederick L.). **The Leprosy Situation in the United States in 1923.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 22. Vol. 83. No. 21. pp. 1707–1708.

The Federal leprosarium was opened at Carville in 1921, and by October 1st, 1924, 297 patients had been admitted. Letters addressed to every State Health Officer revealed most cases in the Southern States and California, nearly half those at Carville coming from Louisiana. Many of the States are now free, while only a few lepers are known in most of these remaining infected, the great practical value of the Federal leprosarium being already evident.

L. R.

MARTIN & DEKESTER. **Contribution à l'étude de la lèpre au Maroc et en particulier dans la région de Fès.**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 204–218. With 1 fig. [12 refs.]

This further report on leprosy in Morocco shows that the disease is frequent in the country. A map shows that the cases mostly occur north of Fez, while the disease is believed to date back to the time of the Phoenicians. Notes of seven cases treated with eparseno are considered not to allow of any general conclusions regarding its value, but they show that the high doses advised by J. HASSON may be dangerous. The establishment of leprosaria on the lines of agricultural colonies with a hospital, and not as prisons, is advised.

L. R.

MORISSEAU. **Considérations sur l'étiologie de la lèpre au Soudan.**—*Rev. Méd. et Hyg. Trop.* 1924. May–July. Vol. 16. No. 5. pp. 129–133.

The writer confirms ROGERS' observations on the influence of climate on the incidence of leprosy, the regions of the Soudan with a short rainy season and a dry climate showing few lepers, while there are many lepers further South in the hot humid climate of the Boho-

Bouques area. Here, too, since the inhabitants wear few clothes and have no ideas of hygiene, and flies are very abundant, infections are more numerous. The people also eat earth, possibly contaminated by flies, which the author thinks more easily spread the lepra bacillus than mosquitoes. He considers that infection is more likely to take place through the alimentary canal than through the skin, but produces no evidence in favour of that theory and admits that it is not proved.

L. R.

MORGAN (F. G.). **Report on the Investigation of a Number of Cases of Leprosy at Nauru, Central Pacific.**—*Commonwealth of Australia Dept. of Health Service Publication.* No. 25. 24 pp. With 1 chart in text.

This is an interesting report on a careful investigation of a recent outbreak of leprosy in a small island under the complete control of a Company, where 39 cases have been discovered since 1920, all but two among the local inhabitants, probably originating from a Gilbert Island woman between 1911 and 1914, and spreading from three main centres of infection. Routine nasal swabbing proved of no value in detecting early cases, only two cases, both advanced, out of 29 being positive, but smears from excised suspicious lesions gave positive results, although not infallible. Early macules most frequently appeared on the upper arms, and in maculo-anaesthetic cases a piece of tissue excised without pain from the centre of a patch enabled bacilli to be found in 7 out of 17 such cases. The cases have been all isolated and are being treated efficiently, and new cases are being watched for, so the further progress of this outbreak will be of great interest.

L. R.

DE ALBUQUERQUE (Oswaldo Cavalcanti). **Formas clinicas e symptomatologia da Lepra.**—*Rev. Med.-Cirurg. de Brasil.* 1924. July. Vol. 32. No. 7. pp. 364–371.

The author presents in this paper a brief résumé of the symptomatology of leprosy. He mentions first the site of entrance of the bacillus and the variable incubation period, and then passes on to describe "cutaneous leprosy," dividing the disease into four periods: (1) That of the development of the maculae which may be hyperchromic, hyperaemic or achromic. During this there are various trophic and sensory symptoms; (2) the nodular period, which merges into (3) the period of evolution of the nodules; (4) progress and termination, death resulting in many cases from intercurrent disease.

The nervous form is divided into a period of invasion, followed by that of eruption which may resemble one or other of those of cutaneous leprosy, but is often pemphigoid. This is succeeded by a "neuritic" period which passes into the degenerative phase with consequent anaesthesia, amyotrophy and mutilation.

H. Harold Scott.

i. HUDELO & PIERROT. **Gomme du dos du nez à bacilles de Hansen au cours d'une lèpre tuberculeuse.**—*Bull. Soc. Française Dermat. et de Syph.* 1924. July. No. 7. pp. 355–356.

ii. DORE (S. E.). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Section of Dermat.) 1924. Dec. Vol. 18. No. 2. pp. 16–17.

iii. BRAYTON (Nelson D.). **Leprosy, with Report of a Case in Arizona.**—*Southwestern Med.* 1924. Oct. Vol. 8. No. 10. pp. 480–483. With 1 fig.

iv. HOLDERMAN (H. H.). **Leprosy: Report of a Sporadic Case developing in Pennsylvania.**—*Jl. Amer. Med. Assoc.* 1924. June 14. Vol. 82. No. 24. pp. 1927–1928. With 2 figs. [8 refs.]

v. BARRERA (F. de P.) & CHAVARRÍA (A. Peña). [**The Acute Phases in Chronic Leprosy.**]—*Rev. Méd. de Bogota.* 1924. Vol. 42. p. 69. [Summarized in *Jl. Amer. Med. Assoc.* 1924. Oct. 18. Vol. 83. No. 16. p. 1281.]

i. The writers record a case of leprosy with febrile attacks, accompanied by the formation of a sort of semi-fluctuating gumma-like swelling in the nose, which on puncture yielded a sero-purulent fluid containing Hansen's bacillus.

ii. A nodular case in a boy of 14, who developed leprosy this year. His father, with whom he lived for ten years, had suffered from anaesthetic leprosy since the child was eleven months old, having been born in this country and never left it, so the child must have been infected in England.

iii. A sporadic case of nodular leprosy of an advanced stage; the patient had come from Mexico, and had returned after being deported there.

iv. An early case of nodular leprosy in a woman aged 26. She had lived for many years in Brazil before coming the United States in 1920, and presented no features of special interest. The author makes the curious statement that in Calcutta the nastin treatment is now used.

v. This paper deals with observations already noticed. (See this *Bulletin*, Vol. 21, p. 864.)

L. R.

LARA (C. B.), DE VERA (B.), SAMSON (J. G.) & EUBANAS (F. C.). **Chief Causes of Death among Lepers at the Culion Leper Colony.**—*Jl. Philippine Islands Med. Assoc.* 1924. Aug. Vol. 4. No. 8. pp. 289–306. [11 refs.]

This paper supplies much valuable information on a subject regarding which little has been recorded. Since its establishment almost eighteen years ago the colony has been a small town with the people living in their own houses under natural conditions, while during the last two years the new treatment has been carried out on a large scale with the aid of four additional physicians, and post mortems have been performed in one-third of the fatal cases; clinical records extend back to 1908. 360 recent autopsies showed the most frequent causes of death to have been Tuberculosis 24·0 per cent., Nephritis 16·3 per cent., Broncho-pneumonia 9·3 per cent., Dilatation of heart 7·6 per cent., Endocarditis 5·0 per cent., Amoebiasis 3·3 per cent., Lobar pneumonia 3·0 per cent., Gangrene 2·3 per cent., Leprosy 2·3 per cent. and other diseases in still smaller proportions. The earlier less accurate clinical records showed much higher figures for leprosy itself and for beriberi,

and much lower ones for tuberculosis, organic heart disease and nephritis in particular. A great change took place in the figures with the increase in the medical staff and in the frequency of post mortems in 1922, as shown in Table 3.

TABLE 3.

INFLUENCE OF THE CHARACTER OF THE PERSONNEL ON THE MORTALITY FIGURES.

	T. B.	Nephritis.	Cardiac.	Gangrene Sept. & Col.	Leprosy.	Malaria.	Dysen.-Enter.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1921.							
Clinical figures (inadequate staff).	30·0	3·1	7·7	3·7	21·7	6·2	7·3
Autopsy on 11 cases (Dr. Wade).	63·6	6·1	—	6·3	—	—	—
1922.							
Clinical figures (increased staff).	51·4	6·7	3·6	3·6	7·1	2·8	2·8
Clinical and autopsy combined.	54·5	8·2	4·2	3·6	(None autopsied)	2·8	2·3

The tuberculosis rate is nearly double, nephritis more than double, while leprosy declined to but one-third of the 1921 rate, showing that many of the tubercular and nephritis cases were formerly not recognized, while most of the deaths attributed directly to leprosy were wrongly diagnosed. The influence of treatment from May, 1922, to December, 1923, is illustrated by the figures in Table 4.

TABLE 4.

CHIEF CAUSES OF DEATH IN TREATED AND UNTREATED GROUPS OF PATIENTS, MAY, 1922, TO DECEMBER, 1923.

Group.	Total Deaths.	Tuberculosis.		Nephritis.		Heart Disease.		Pneumonia.		Gangrene Sept. Inf.		Dysent. or Enter.		Leprosy.		Cerebral Hemor.		Malaria.		Other Dis.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Treated ..	282	91	32·2	74	26·2	28	9·9	19	6·7	9	3·1	9	3·1	7	2·4	6	2·1	6	2·1	32	11·3
Untreated ..	415	309	74·4	41	9·8	26	6·2	9	2·1	4	0·9	2	0·4	11	2·6	7	1·6	1	0·2	5	1·2

NOTE.—Patients who received treatment for only a short time were not included in this table.

The high rate from tuberculosis in the untreated is due to that class containing a much greater proportion of tubercular patients, who do not stand the treatment well. Nephritis, on the other hand, gave almost three times as high a proportion in the treated class, in spite of more early cases being included among them; indicating that the prolonged use of the ethyl ester chaulmoogrates damages the kidneys in some cases. Deaths from organic heart disease, chiefly due to acute dilatation, were also slightly more common among the treated, as well as from acute concurrent affections, which is, however, attributed to the patients being stronger and engaging in activities exposing them to infections. Deaths from leprosy were about equal in the two groups, no decrease among the treated being evident, owing to the treatment occasionally exciting an acute exacerbation of the disease ending fatally or to repeated reactions leading to debility and emaciation; there is evidence to show that tuberculosis-complicated cases died sooner under the treatment, which is not now given in such cases, the tubercule death rate having since fallen slightly in 1923. The increase of nephritis deaths from 8·2 per cent. in 1922 to 18·4 per cent. in 1923 is undoubtedly due to the treatment, while in some it ended in acute dilatation of the heart. The nephritis occurred most in early cases, and tuberculosis in late nerve cases. Death from leprosy itself increases up to the 15th year of the disease, and then decreases owing to the tendency to arrest.

L. R.

KOBAYASHI (Wasaburo). [**On a New Method of Detection of** *Lepra Bacillus* **in Testicular Tissues, and on Early Diagnosis of Leprosy.**]—*Hifuka Kiyo.* (*Arch. of Dermat*). 1924. Jan. Vol. 2. No. 3. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. pp. 269–270.

"The author examined the puncture fluid of the testes in numerous cases of leprosy and could demonstrate the bacillus from the fluid even from cases having no outward changes in the testes, even if the bacteriological examination of other materials should prove negative. He extols the necessity of the puncture examination of the testes for the early diagnosis of leprosy." The summary does not state if the method was popular with the patients.

L. R.

HASSELTINE (H. E.) & GORMAN (P. J.). **A Comparative Study of the Schultze-Tigges and the Ziehl-Neelsen Methods of Staining** *B. leprae.*—*Public Health Rep.* 1924. Oct. 24. Vol. 39. No. 43. pp. 2683–2685. [1 ref.]

The writers have tested the new method described by SCHULTZE–TIGGES in duplicate slides to those stained by Ziehl-Neelsen from 100 lepers, snips of skin and nasal scrapings being taken for the purpose, and find the older method slightly more efficient; it is also easier for the microscopist's eye than the yellowish pink background of the new method.

L. R.

NICOLAU (S.) & BANCIU (A.). **Sur une particularité différentielle de la réaction de Bordet-Wassermann dans la syphilis et la lèpre.**—*C. R. Soc. Biol.* 1924. Dec. 19. Vol. 91. No. 36. pp. 1352–1354.

The writers' experience with the Wassermann test agrees with that of others. They obtained positive results in 22 out of 27 lepers, but on using the method of progressive dilutions with physiological salt solution in cases of leprosy and syphilis giving positive reactions they found that the titre of the reaction in lepers greatly surpassed those of syphilis. In syphilis the fixative power of the serum was lost at from the fortieth to the fiftieth dilution, while in 18 cases of leprosy it ranged from 1 in 70 to 1 in 280 dilutions, obtained by mixing 0·1cc. of leprous serum with 1–5, 1–10, 1–20, etc., of salt solution and using 0·1 cc. of the freshly made mixture for the test. In only four cases was fixation not obtained below 1–20 or 1–30 dilutions, all mixed cases, two of which were predominantly nerve cases. They have found this method of great value in the diagnosis of leprosy, including incipient cases.

L. R.

SCHÖBL (Otto) & BASACA (M.). **Contribution to the Serology of Leprosy.**—*Philippine Jl. Sci.* 1924. July. Vol. 25. No. 1. pp. 1–9. [2 refs.]

The authors have tested the globulin precipitin test by the following simple method. Blood is taken from a vein and the serum allowed to separate in a test tube wetted with normal saline; 0·2 cc. of serum is placed in each of a series of small tubes, to each of which 0·6 cc. of distilled water is added carefully to avoid its mixing with the serum with Wright's pipettes, one tube remaining undisturbed and the other mixed thoroughly by shaking, the tests being performed not more than five hours after taking the serum. A preliminary reading was made after standing at room temperature (average 27° to 28°C.) and again the next morning after placing in a refrigerator; a distinct contact ring, or a diffuse cloudiness in the mixed tube and a sediment in each at the final reading, most marked in the mixed tube, indicated a positive reading. Tables are given of the results in a selected series of cases, which indicate that all forms of leprosy, treated and untreated, early and advanced cutaneous cases, bacteriologically negative nerve and presumably cured cases, gave positive results, although less pronounced in the cured than in the active cases; while the control healthy sera were all negative. On the other hand, the Wassermann test was only positive in 35 per cent. of the cases. To establish a standard strength for the reaction the sera were diluted 1 : 1, 1 : 2, 1 : 3, 1 : 4 and 1 : 5 in both lepers and non-lepers, and no positive reactions were found in non-lepers with dilutions of 1 : 3 or less, but they might occur in dilutions of 1 : 4, the cured cases giving less marked reactions than active ones. The reaction is promoted by a low temperature and does not always occur at a high one. The reaction in leprosy is considered to be due to "an upset balance between the salts and globulin, possibly euglobulin."

L. R.

LEÃO (Antonio Eugenio de Arêa). [In Portuguese and English.] **As reacções de Wassermann e de Sachs-Georgi na lepra. The Wassermann and Sachs-Georgi Tests in Leprosy.**—*Mem. Inst. Oswaldo Cruz.* 1923. Vol. 16. No. 1. In Portuguese pp. 47–57. In English pp. 59–69.

The author refers to previous literature, and then records his own experience, which cannot be better summarized than in his own conclusions :

"1. In leprosy, the Wassermann test is frequently positive. In 50 per cent of cases with antigens of luetic liver (from foetus with hereditary syphilis), of cholesterinised human heart and of cholesterinised ox-heart ; in 32 per cent. of cases with the antigens of acetone-insoluble lipoids (NOGUCHI or BORDET processes) and in 14 per cent. of cases with LESSER's antigen (ethereal extract of organ).

"2. The degree of fixation varies greatly according to the antigens employed. It is, however, the antigens prepared with liver of foetus with hereditary syphilis and those with cholesterinised ox-heart that give the greatest fixation.

"3. The greatest number of positive Wassermann reactions is given by the macular (87·5 per cent.) and tubercular (65·2 per cent.) forms of leprosy. The nervous form of the disease furnished 17·7 per cent. of positive reactions.

"4. The cause of complement fixation by leprous serum when mixed with a syphilitic antigen is certainly to be explained by the poly-fixing properties of the serum.

"5. The Sachs-Georgi test in leprosy gives a total percentage of 36 per cent. positive reactions.

"6. The greatest percentage of Sachs-Georgi positive reactions is given by the macular form of the disease (62·5 per cent.), the next greatest by the tubercular form (39·2 per cent.). The nervous form gives a percentage of 17·7 per cent. positive Sachs-Georgi reactions."

L. R.

MUCHOW (Hermann) & LEVY (D. M.). **Een sero-diagnostische leprareactie.** [A Sero-Reaction of Diagnostic Value in Leprosy.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Nov. 15. Vol. 68. 2nd Half. No. 20. pp. 2461–2464.

The following extract was prepared : A leprous nodule was triturated with a mixture of equal parts of alcohol 96 per cent. and of physiological salt solution, the quantity used being equal to five times the triturated mass of tissue. The whole was left at room temperature for eight days. Then it was filtered and inactivated at 56°C. for half an hour. Of this extract 0·2 cc. was mixed with 0·5 cc. of a 10 per cent. solution of NaCl and 0·2 cc. of the serum of a leper (4 cases) or a man not suffering from this disease (4 cases). After shaking thoroughly, the mixture is centrifuged. The reaction is considered to be positive if the test-tube, when shaken, shows flakes floating in the fluid. It was strongly positive in all of the four cases of lepra, completely negative in the others. The serum of 33 patients suffering from other disease (among which there were 18 suffering from various dermal diseases) was tested in the same way, with a negative result. If the extraction of the leprous tissue was performed with alcohol 96 per cent. alone, the reaction proved negative ; with equal parts of alcohol 96 per cent. and ether or with physiological salt solution alone the specificity was lost, the non-leprous sera sometimes showing a slight positive reaction.

N. H. Swellengrebel.

MARIANI (Giuseppe). **Osservazioni sopra una forma speciale di allergia cutanea nella lebbra (lepra tubercoloide sperimentale nell'uomo).** [A Special Form of Cutaneous Anaphylaxis in Leprosy.]—*Pathologica.* 1924. Sept. 15. Vol. 16. No. 380. pp. 471–477.

The author excised a recently developing leprous nodule, rich in bacilli, but still covered with intact skin, and emulsified it. Part of the emulsion was injected subcutaneously and intraperitoneally into guineapigs and white mice. An inflammatory reaction ensued with disintegration of the bacilli, but no nodules developed. The remainder of the emulsion was used for the intradermal reaction in 10 lepers, 8 of the nodular or mixed form and 2 of the purely nervous. In the former there was erythema with itching and a sense of heat, followed in 3–6 days by a faintly visible infiltration. There was no febrile reaction nor any glandular enlargement. The whole disappeared in 8–12 days. Repeated examinations showed that the bacilli rapidly disappeared and in 3 days there were merely a few scattered granular organisms seen.

In patients suffering from the nervous form there was a very slight local reaction with itching in 4–8 days, no rise of temperature. After 10 days there was some infiltration, and local swelling developed slowly with the formation of a central vesicle by the 20th day which attained the size of an orange pip, and was surrounded by a reddish, dense border. The lesion reached its maximum development in 30 days and remained thus for the next 10 days, after which it gradually receded, finally clearing up, with some central loss of tissue, in about 60 days. There were no constitutional symptoms nor any enlargement of glands. The bacilli which were abundant in the inoculated emulsion showed similar disintegration as with the nodular type of cases. The reaction in the nervous form was more of a granuloma-like nature than in the nodular. The remainder of the paper is devoted to an account of the histological changes produced. The reverse of the above experiments, namely, inoculation of tissue from a nerve-leprosy patient into one with the nodular form has not yet been carried out.

H. Harold Scott.

READ (Bernard E.). **The Toxicity of Chaulmoogra Oil (Oleum Hydnocarpi).**—*Jl. Pharm. & Experim. Therap.* 1924. Oct. Vol. 24. No. 3. pp. 221–257. [39 refs.]

This is a valuable paper on the little investigated subject of the toxicity of chaulmoogra oil when administered in large doses to animals either orally or by injections of the oil itself or of the ethyl hydnocarpate made from it, rabbits being chiefly used in the experiments. The author concludes.

"1. The toxic affect of chaulmoogra oil is first manifest in producing anorexia, nausea and emesis.

"2. The character of the emetic effect is probably both that of a local irritant and that of a central excitant. The central action is most pronounced and is produced irrespective of the path of administration of the drug.

"3. There is evidence of a cumulative central effect, which after a succession of therapeutic doses may produce emesis and anorexia.

"4. The emetic and other toxic effects of chaulmoogra are apparent after the administration of ethyl hydnocarpate. On account of its solubility, hydnocarpic acid, as the glyceride or the ethyl ester or as a salt, is probably the most active constituent of chaulmoogra preparations.

"5. Toxic doses of the hydnocarpates show hemolysis of blood cells, renal irritation with hemoglobinuria, and fatty infiltration of the liver. When injected subcutaneously and intravenously there is local irritation, often leading to necrosis of tissue.

"6. Ethyl hydnocarpate injected intravenously into a dog produces a marked increase in the lymph flow.

"7. The M.L.D. of chaulmoogra oil to rabbits by mouth is 5 cc. per kilogram of body weight. Ethyl hydnocarpate by intravenous injection produces death after 0·5 cc. per kilogram of body weight.

"8. Fatal doses of chaulmoogra oil given to rabbits produces a hypersensitivity with lowered blood calcium and inco-ordinated movement, followed by a period of convulsive retching of a strychnine-like character. Death results from respiratory failure.

"The local pulmonary effect is considered to be less important than that active centrally, which produces excitement with subsequent paralysis associated with deafness and blindness, and loss of control of the motor nerves.

"9. There often occurs a rise in temperature following the intravenous injection of ethyl hydnocarpate. A fatal outcome is preceded by a fall in temperature.

"10. Administration of therapeutic doses of the hydnocarpates to dogs assists the well-being of the animal as demonstrated by the general appearance and by increase in weight; but when given to rabbits maintained on a plain oat diet it has an intense toxic effect. There is produced anorexia, albuminuria, loss of body weight, and eventually death."

L. R.

ROUILLARD (J.). **Chaulmoograte et morrhuates de soude : leur emploi dans le traitement de la lèpre et de la tuberculose.**—*Presse Méd.* 1924. Nov. 22. Vol. 32. No. 94. pp. 929–931. [6 refs.]

A long abstract of the Croonian Lectures of 1924. [*See above*, p. 208.]

L. R.

MUIR (E.) assisted by DE (N. K.), LANDEMAN (E.), ROY (T. N.) & SANTRA (I.). **The Preparation of Hydnocarpus Esters and their Use in Leprosy.**—*Indian. Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 221–233. With 1 text fig. & 3 plates.

The authors point out that *Taraktogenos kurzii*, from which true chaulmoogra oil is obtained, grows in rather inaccessible places in Burma and North East India, and its fruit ripens and falls during the rainy season, when the forests are practically inaccessible, so the fruit is not obtained fresh; but *Hydnocarpus wightiana*, with which they deal in this paper, grows freely in a wild or cultivated state in South and West India, and its oil, which is at least equally effective in leprosy, is easily and cheaply obtained in unadulterated form, while on cultivation it fruits abundantly and at all seasons of the year after 6 or 7 years' growth, and is readily grown from fresh seed. In Calcutta the esters are now prepared solely from this oil, and can be made cheaply and simply by either of the following processes :—

"1. *Hot process.*—425 grammes of crude, cold drawn hydnocarpus oil, 552 cc. of 96 per cent. ethyl alcohol, and 31·87 cc. of sulphuric acid (sp. gr. 1·845) are placed in a 2½ litre flask fitted with a reflux condenser, the alcohol and oil being mixed before adding the acid. The contents of the flask are allowed to boil vigorously on a water bath for four hours without intermission. Under the influence of the mineral acid catalyst, the glycerol radicle in the glyceride of the oil changes place with the ethyl group in the alcohol, forming the ethyl ester and glycerol. The reaction product is then transferred to a separating funnel and washed with an equal volume of water twice over, and then with a 0·2 per cent. solution of sodium carbonate in water which forms a thick emulsion; after half an hour crystals of common salt are gradually added in small quantities and brought in contact with the emulsion by slowly rotating the vessels so as to break the emulsion. As this takes place the water forming in the lower layer is gradually removed and the upper layer consisting of esters is filtered through thick filter paper. The esters, though now clear, still contain a certain amount of fine emulsion which makes them dark in colour. This may be removed rapidly by drying in a steam oven for two hours or by leaving at room temperature for 5 or 6 days, when the fine emulsion will sink to the bottom, whence it may be removed. The esters are then filtered again and the process is complete.

"2. *Cold process.*—This takes a considerably longer time than the hot but it has the advantages that no special apparatus is required, labour is less, and any therapeutic value which would be destroyed by boiling is preserved. The oil, alcohol and acid are mixed in the same proportions as in the hot process in a 4 lb. bottle with a tightly fitting glass stopper and left until the process of esterification is complete. The bottle should be shaken once or twice a day to mix up the upper and lower layers. This hastens the process, as does also the placing of the bottle in the sun or in some warm place. Neither the shaking nor the heat is, however, essential if time is not a consideration. To begin with, the oil forms a lower and the alcohol and acid an upper layer. As esterification proceeds a point is reached at which the lower layer, now chiefly composed of esters, gains a less specific gravity than the upper layer, which now contains a large proportion of glycerol, and therefore rises to the top. To ensure the completion of the esterification it is well to allow the process to continue further for half the time which elapsed between the mixing of the ingredients and the rising of the lower layer. Thus, if the lower layer takes 14 days to rise, the ingredients should be left in the bottle for 7 days longer. The lower layer is then drawn off and the upper layer, consisting of esters, washed according to the method mentioned under the 'Hot Process.' The esters may be washed in the same bottle in which they have been prepared by substituting for the glass stopper a cork stopper perforated with two glass tubes, the one two inches in length inserted flush with the inner end of the cork and fitted with a piece of rubber tubing compressed with a spring clamp, and the other reaching from the cork to the bottom of the bottle. By inverting the bottle the esters rise to the top and the lower layer may be drained off by opening the spring clamp. Or the lower layer may be syphoned off through the long glass tube without inverting the bottle.

"The weight of the esters recovered is almost equal to the weight of oil used."

If *Hydnocarpus wightiana* is grown in all leprous countries, as it should be, every leper institute could easily make its own esters by one of the above methods at very little cost. They may be bottled or put up in ampoules and sterilized at 120°C. for half an hour, while the pain and local reaction on injection can be very much reduced by adding an equal quantity of olive oil before sterilization; 3 per cent. iodine added to the esters will kill even anthrax spores in three days, and 1 per cent. iodine will safely sterilize the esters without the aid of heat,

and they may then be kept in glass-stoppered bottles for use on a large scale. Only three unimportant abscesses have occurred in many thousands of injections. The dose of equal parts of the ester and olive oil ranges from 0·5 to 10 cc. intramuscularly or subcutaneously, best into the soft parts of the gluteal muscle with the patient sitting down, or subcutaneous injections may be given beneath the lesions on the extensor surfaces of the limbs, the needle being inserted in several directions through two punctures at opposite edges of the lesions to distribute the dose and hasten its absorption; up to 4 cc. may be given in this manner and any excess into the gluteal region. Intravenous injections have practically been given up on account of coughing and pain in the chest sometimes following them. The initial dose of 0·5 cc. may be increased by 0·5 cc. at each bi-weekly dose up to the highest tolerated dose without raising the temperature to 100°F. for 24 hours or producing a local inflammatory reaction in the lesions. The addition of either creosote, or probably better thymol in the proportion of 8 grammes to 50 cc. each of undistilled hydnocarpus esters and olive oil, enhances the action, although thymol alone is inferior.

The treatment should be continued until all lesions have disappeared, except permanent nerve ones, and repeated negative bacteriological examinations have been made. Where failures have been reported either the treatment has not been carried out thoroughly and persistently with attention to diet, hygiene, etc., or unsuitable cases, with permanent lesions (due to nerve or tissue destruction) have been chosen. Early cases naturally give the best results, so early diagnosis is essential.

To clear up the question of the value of different oils, esters of hydnocarpus with a closed carbon ring, and the highest specific rotation, and linseed oil with highest iodine value and amount of unsaturated fatty acids, were tried, and the former gave 6 per cent. cleared up completely and 54 per cent. much improved, against 1 per cent. and 49 per cent. with linseed esters; while coconut esters, with the lowest proportion of unsaturated fatty acids, were less effective than linseed ones, so that both the closed carbon ring and the amount of unsaturated fatty acids appear to be factors of value. Illustrations of chaulmoogra and hydnocarpus seeds, as well as of the *Hydnocarpus wightiana* tree, are given, one of two years old being six feet in height. This paper contains many other points of minor practical interest and should be read in full by all who have to treat leprosy.

L. R.

WILSON (R. M.). **Chaulmoogra Oil and Ethyl Esters in Treatment of Leprosy.**—*China Med. Jl.* 1924. Sept. Vol. 38. No. 9. pp. 743–745. With 1 fig.

This paper opens with the cheering sight of a photograph of 59 lepers, who have been discharged as apparently cured after treatment with chaulmoogra oil, while on May 1st, 1924, 75 patients were discharged apparently cured and 40 more are expected to be ready for discharge in a few months. All these have been treated in Korea by injections of the oil, given by themselves, which in Dr. Wilson's experienced hands has yielded better results than the ethyl esters obtained from the Peking Union Medical College and from Dr. SHIGA of Seoul Hospital; after two years' use, with an average treatment of

six months, the lepers refused to continue the esters, as they complained of dryness of the skin, eye troubles, including disturbance of vision, general weakness and loss of strength, headache, muscular pain, or failure to improve.

The treatment now used successfully consists of weekly subcutaneous injections of 3–8 cc. of sterile chaulmoogra oil [species not mentioned, but *Hydnocarpus anthelmintica* is the common Chinese variety] to which 1 per cent. of camphor has been added, only slight pain resulting from the shallow injections into the muscles now given. During the past year 575 cases on the average were under treatment, half on injections and half on oil orally. After two or three years' injections the patients are so far restored to health that they continue on oil orally. Baths twice a week, regular work and good hygiene are equally important, and marked improvement is observable in three to six months' treatment. Complications are treated and infectious cases isolated, but those with tuberculosis improve but little.

L. R.

HEINEMANN (H.). **Ueber Behandlung der Lepra mit Thymol.** [Treatment of Leprosy with Thymol.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 523–525. [3 refs.]

The writer claims to have improved on HAMZAH's method of treating leprosy by intramuscular injections of 10 per cent. thymol in codliver oil [this *Bulletin*, Vol. 21, p. 182], by using intravenous injections of 651a, a thymol emulsion prepared by VON HEYDEN, and used by KRUTZSCH in tuberculosis. The first dose for adults is 0·2 cc., increased by 0·2 cc. at each injection up to a maximum of 0·8 cc., which can be continued every fourth day for months without harm, only slight cough being produced. He has treated 70 cases of leprosy, and given over 1,000 injections, and reports striking improvement in a relatively short time, although it is too early to say if cures can be obtained. As is so usual with German work, the exact composition of the new preparation is not published in this paper.

L. R.

TOURNIER (E.). **De l'emploi du kermès dans le traitement de la lèpre.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 761–765. [5 refs.]

Favourable reports of the use of antimony salts in tropical diseases, including leprosy, led him to look for a less toxic preparation than tartar emetic, and to treat two cases of leprosy with kermes (Stibium sulfuratum rubrum) alone, and two in conjunction with atoxyl and novarsenobenzol with favourable results, especially in the nodular and mixed cases. In adults daily oral doses of 0·50 to 0·60 cgm. in water are given without nausea or albuminuria and can be continued for nearly two months, while it is not depressing, and its use can be combined with ethyl chaulmoograte or other treatment. In the nodular cases marked improvement, accompanied by breaking up of the bacilli into granules, was noted within a month or two, while the pains of the nerve form are also alleviated greatly. The method is so simple and easily carried out that it is worthy of a more extended trial, no cure having yet been obtained with it.

L. R.

WALKER (Norman). **A Case of Leprosy. Treated by a Vaccine prepared from a Nodule from the Patient's Arm. With a Note on the Preparation of the Leprosy Vaccine by** LISTON (Glen), **and a Note on the Histology of the Case by** DAWSON (J. W.).—*Lancet.* 1924. Sept. 13. pp. 542–543. With 1 coloured plate & 1 text fig.

An advanced nodular case of leprosy, in which after a few injections of chaulmoograte of sodium this treatment was abandoned on account of the pain produced. As the author had found a vaccine prepared from tuberculous glands of value in lupus, he got Lt.-Colonel Glen LISTON, I.M.S., to make a sterile emulsion in normal saline of a removed nodule after grinding it in a mortar with sand; the emulsion was heated to 60°C. for half an hour, diluted with carbol saline to contain roughly 200 million lepra bacilli per cc., and put up in ampoules. The rst dose of 0·1 cc. was gradually increased to 1 cc. without any severe reactions. Improvement began within three weeks, and after two months was very marked, the large nodules on the arms having nearly disappeared in that time, as shown in a coloured plate, while the general condition had also improved, the result so far being apparently greater than in previously recorded cases of this method of treatment. Sections of nodules before and after treatment showed a great diminution of the rod-shaped bacilli with disintegration of many of them into acid-fast dots, together with some fibrosis of the tissues.

L. R.

GOODHUE (William J.) & HASSELTINE (H. E.). **Report of Reexamination of a Child in whom Leprosy developed at Nineteen Months of Age.**—*Public Health Rep.* 1924. Oct. 24. Vol. 39. No. 43. pp. 2680–2683.

This child of leper parents, at the Molokai settlement of Hawaii, developed leucodermic patches on the right cheek and on the back of the thighs (without anaesthesia) of doubtful nature, and a reddish-brown slightly-raised nodule, in sections of which acid-fast bacilli were found, the leucodermic patches and nasal smears being negative. The child had been removed from leprous surroundings within six hours of birth, as is now the custom of the colony, and had not since been in contact with lepers, and appears to have been the first child so removed to have developed leprosy among about 100 born in the settlement since their early isolation has been carried out. Four months after the excision of the nodules there was no evidence of the progress of the disease and the scar was free from acid-fast bacilli, this being in October, 1915; the child was kept separate from the other healthy children. In May, 1916, a few atypical acid-fast bacilli were found in the scar of the excised nodule, and the child was declared a leper and returned to her parents in the colony, although the writers now think that further observation would have resulted in negative findings.

On January 8th, 1923, the child, now 10 years of age, was re-examined, and only showed some old standing leucodermic patches with normal sensation, and the scar at the site of the former nodule was negative bacteriologically, as were nasal smears. On June 21st, 1924, negative findings were again obtained, and there is now no evidence of her being a leper, although she had received no anti-leprous treatment other than the excision of the nodule, and she is considered to be free from the

disease. The writers add: "This belief is strengthened by the results more recently obtained by us by the surgical removal of nodules in other patients who have a few nodules which are small and well defined." [This is a most important observation, especially in view of the numerous cases now coming forward in the earliest stages of leprosy, and it supports MUIR's contention that many of the first noticed lesions are the site of primary infection through the skin, for which early excision is now clearly indicated. If the value of this measure is confirmed by further experience it will be still easier to attract the early cases for treatment, with ultimately more rapid diminution of the incidence of the disease.]

L. R.

RHO (Filippo). **Cupric and Cyanocupric Preparations in the Therapy of Tuberculosis and Leprosy.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp. 315–320. [32 refs.]

Professor Rho of Italy, after giving the history of the ancient use of copper compounds in tuberculosis, and the recent use of cyanocupric compounds by KOGA and his followers in Japan in both tuberculosis and leprosy, narrates his own work on the subject in Italy, where Professor SERONO made a series of such salts, since the Japanese workers, in accordance with the practice of their German teachers, have not revealed the precise nature or mode of preparation of the compounds they used. A stable soluble compound named Cuprocyan, consisting of a double cyanide of copper and potassium, containing 22·26 per cent. of copper, and having the form of white clinorhomboidal crystals, very soluble in both water and alcohol, was made; a 2 per cent. solution is sold in 2 cc. ampoules, containing 4 mgm. of cuprocyan, one of which may be injected every other day hypodermically or intramuscularly with little pain. For slow intravenous injection every five to seven days 10 cc. phials are also supplied, the first dose being 5 cc., followed by 7½ and then 10 cc. doses, and either form of treatment may be continued for many months with occasional intervals. Another preparation, called cuproiodase, is a lipoid compound of copper, iodine and cholesterin, used for local applications in surgical tuberculosis and to destroy the lesions of leprosy.

In pulmonary tuberculosis good results are claimed in first and second stage cases, but not in the third stage, while the cuprocyan is reported to lead to the formation of fibrous tissue around the lesions. In leprosy 20 cases treated in Sicily and Sardinia by cuprocyan intravenously gave improvement after 10 injections in almost all the patients, while cuproiodase locally produced healing of local ulcers except perforating ones. Microscopically nodules were found to become fibrosed and the bacilli became fewer and broke up into granules with marked benefit, although the author cautiously adds that in such a chronic disease "it is quite impossible to think of putting a definite stop to the relapsing manifestations of the malady, unless with a very long treatment, even of many years." It is suggested that this method of treatment might be used with advantage in addition to the chaulmoogra oil preparations.

L. R.

i. SCHÖBL (Otto) & KUSAMA (Hiroshi). **Chemotherapeutic Experiments with Chaulmoogra and Allied Preparations. III. The Disinfecting Power of the Vapors of Vegetable Oils toward Acid-Fast Bacteria.**—*Philippine Jl. Sci.* 1924. Apr. Vol. 24. No. 4. pp. 443–445.

ii. ——. **IV. A Survey of Certain Organic Compounds as to their Growth-Inhibiting Activity toward Acid-Fast Bacilli in Vitro.**—*Ibid.* Aug. Vol. 25. No. 2. pp. 123–134. [2 refs.]

iii. ——. **V. An Inquiry into the Mechanism and Nature of the Growth-Inhibiting Effect of Chaulmoogra and other Vegetable Oils.**—*Ibid.* pp. 135–150. [13 refs.]

i. These experiments were carried out by exposing the surface of glycerine-meat-infusion-agar slants, recently inoculated with a vigorous strain of human tubercle bacilli, to any vapours given off by about 0·1 cc. of the substances tested placed on the inner end of the cotton plug, which was quickly reinserted into the tube and sealed with liquid paraffin ; freshly inoculated cultures of staphylococcus, cholera vibrio and dysentery and coli bacilli also being tested. The vapours of chaulmoogra and hydnocarpus oils showed no disinfecting action on the acid-fast bacilli, but many essential oils, including bergamot, cinnamon, caryophyllum, eucalyptol, Pinus sylvestris and turpentine, completely inhibited the growth of one loopfull of viable tubercle bacilli incubated at 37°C. under these conditions.

ii. This is a highly technical paper on further tests of the growth-inhibiting activity on cultures of tubercle bacilli of various organic compounds, by adding them in solution or mixture to culture media, as in former series, with the following results :—

"1. Water-soluble compounds showed an antiseptic effect, whereas the fat solvents such as benzol, toluol, xylol, carbon trichloride, and carbon tetrachloride which have a strong hypnotic effect were found to be only slightly antiseptic or not at all.

"2. Sodium, copper, and nickel salts of fatty acids were found about equally effective, whereas zinc, strontium, lead and uranium salts showed no effect.

"3. The double-bond-containing compounds all showed antiseptic effect, the double bond being more effective on the side chain than on the ring in aromatic compounds.

"4. Unsaturated alcohols showed an antiseptic effect, particularly when containing the phenyl group which proved to be the most powerful toxic group.

"5. High alcohols approaching waxes showed no effect. Secondary alcohols were equally or less effective than primary alcohols.

"6. Hydroxy compounds are highly antiseptic toward acid-fast organisms, as they are toward other bacteria.

"7. The antiseptic effect of phenols increases with the number of hydroxyl groups, the position of these groups being of importance, as the ortho-compounds are more antiseptic than the para or meta compounds.

"8. Alkylation on the ring increases the antiseptic effect of phenols, whereas alkylation on the OH group of polyhydroxy-phenols has no noteworthy effect, provided at least one hydroyxl is preserved free.

"9. The animo group (NH_2) has a reverse effect on the antiseptic power of the aromatic compounds, inasmuch as it has no effect when located on the ring but is strongly antiseptic when linked to the ring directly on the side chain. It acts as a haptophore group, and the strong effect of benzylamine is no doubt due to the function of the phenyl group.

"10. Open-chain terpenes are more effective than their cyclic isomers.

"11. In the cyclic hydrocarbons the double bond in the ring seems to be of importance in the presence of other groups on the ring, but not in itself."

iii. This paper discusses the way in which chaulmoogra and other oils act against acid-fast bacilli in the light of the extensive experiments of the author, from which he comes to the following interesting conclusions :—

"1. The degree of unsaturation of vegetable oils which stimulate the growth of acid-fast bacteria and of those which inhibit the growth of acid-fact bacteria has no relation to their growth-stimulating or growth-inhibiting activity.

"2. The growth-stimulating effect of certain vegetable oils is due to the glyceryl and not to the acid part of the oil.

"3. The condition of unsaturation of the oils containing the acids from the chaulmoogra series and of the oils which stimulate the growth of acid-fast bacteria is paramount.

"4. Saturated chaulmoogra oil lacks the growth-inhibiting activity toward acid-fast bacteria which is possessed by the unsaturated oil.

"5. The growth-inhibiting activity of chaulmoogra oil depends on the structure of the ring of the fatty acids. When the structure of the ring is changed by saturation with hydrogen the oil loses this biologic property.

"6. There are indications that, due to physical properties, acids from the chaulmoogric series containing a short side chain are more effective in vitro than are those having a long side chain.

"7. Acid-fast bacteria adapt themselves to the acids from the chaulmoogric series in due time and then withstand larger doses than they did originally."

The adaptation of the acid-fast bacilli to the action of the chaulmoogra fatty acids explains the frequency with which patients cease to improve after a long course of the treatment with ethyl chaulmoograte, and indicates a change in such cases to preparations from other oils or other drugs of benefit in leprosy.

L. R.

ARAUJO (H. C. de Souza). **A prophylaxia da lepra no Pará.**—*Rev. Med.-Cirurg. do Brazil.* 1924. Aug. Vol. 32. No. 8. pp. 393–402.
[See this *Bulletin,* Vol. 21, pp. 861, 864.]

ROGERS (Leonard). **Recent Leprosy Research and its Bearing on the Tuberculosis Problem.**—*Glasgow Med. Jl.* 1924. Mar. Year 101. New Series. Vol. 19. No. 3. pp. 109–115. [15 refs.]

TROPICAL DERMATOLOGY.

TYAU (E. S.). **The Incidence of Skin Diseases in Shanghai.**—*Nat. Med. Jl. China.* 1924. Apr. Vol. 10. No. 2. pp. 75–79.

The numerical and seasonal incidence of 60 different skin affections based on 5,000 cases is presented in tabular form. Emphasis is laid on the high percentage of scabies, 44·14, compared with that of eczema, 22·84, and of tinea, 13·62.

W. Jenkins Oliver.

CURJEL (Dagmar F.) & ACTON (Hugh W.). **Jute Dermatitis.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 257–260. With 1 coloured plate.

This occupational dermatosis occurring in the mills, particularly in the preparation rooms where the raw jute fibre is being softened by mineral oils, is seen most frequently among the lower Hindu classes as a non-suppurative folliculitis giving rise to no subjective symptoms. Distributed mainly on the exposed parts of the arms and on the front of the legs and thighs, the lesions appear as black points and as larger follicular elevations capped with a black spicule. Histological examination shows a horny plug filling the follicle and apparently causing pressure atrophy of the hair, while the sebaceous gland is unaffected. Treatment consists in thorough washing with soap and applying a 2 per cent. resorcin lotion or salicylic acid ointment.

W. J. O.

TOYAMA. **Further Observations on Lacquer Dermatitis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore 1923.* pp. 824–829. With 7 figs.

Investigations made with various forms of lacquer showed a common toxic substance "uroshiol" in Japan and China lacquers, "laccol" in the Indo-China, Tsuta-Urushi and Formosa varieties and "thitsiol" in Burma lacquer. Describing the action of uroshiol the author points out that infection may occur by the alimentary route, while the common mode of infection is via the skin. In such alimentary infections "none of the visceral organs were affected. [This fact] seems to indicate that lacquer poison possesses a specific power to combine with the cells of the skin." The degree of toxicity of the three substances is in the order (1) uroshiol; (2) laccol; (3) thitsiol. Concerning the toxic properties of these same substances, it is shown that this property depends upon the combined action of the presence of two hydroxyl groups and unsaturated alkyl radicle, the toxicity diminishing with the saturation of the alkyl and successive substitution of the hydroxyl radicles. "In general the toxicity of lacquer is proportional to the amount of toxic substances contained in them." Instructive plates figuring experimental cuti-reactions accompany this interesting communication.

W. J. O.

MENDELSON (W. Ralph). **Tinea Labialis (Betel-Nut Dermatitis of Lips).**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 1. Vol. 27. No. 21. pp. 284–285. With 3 text figs.

Brief report of 3 cases of dermatitis of the lips occurring in Siamese women who were inveterate betel-nut chewers. Cultures

from the scaly lesions of the lips and from the nuts showed an apparently identical mould (not identified). Contamination had probably followed some abrasion of the lips. Rapid healing followed the application of 3–5 per cent. salicylic ointment.

W. J. O.

BLACKLOCK (B.). **Craw-Craw in Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 253–262. With 2 plates. [7 refs.]

A brief résumé of the text-book descriptions of the affection is given and mention made of its wide occurrence among the natives. The characteristic features of the disease and the distribution of the lesions in the cases observed are recorded. A parasite obtained from the central aperture of the recent papules and vesicles was indistinguishable morphologically from *Sarcoptes scabiei*. The conclusion is drawn that craw-craw of the Sierra Leone Creole is identical with scabies, and that the nematode larvae observed in some of the lesions have no etiological relationship with the disease.

W. J. O.

ASKINS (R. A.). **Dermatitis caused by** *Pediculoides ventricosus.* [Correspondence.]—*Brit. Med. Jl.* 1924. Nov. 22. p. 950. [2 refs.]

In this instance the mites (*Pediculoides ventricosus*) got among dockers at Bristol unloading barley from Morocco, and in some cases spread to their families in barley-dust adhering to the men's clothes. The captain and mate of the ship also were attacked, probably through the infested dust in the air.

A. Alcock.

FORNARA (A.). **Un cas de pseudomyiase rampante à Boma.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 139–140. With 1 fig.

The lesion here illustrated occurred in a native child of 1 year. It appeared near the middle of the dorsum of the foot and continued round to and across the sole and then, as here shown, upon the extensor

Case of Creeping Pseudomyiasis in an Infant of 1 year at Boma.
[Reproduced from the *Annales de la Société Belge de Médecine Tropicale.*]

surface of the foot and leg, as a sinuous line first of desquamation and then vesiculous. An abrupt change of direction was caused by application of nitrate of silver. No parasite could be discovered.

A. Alcock.

BUTLER (C. S.), HOUGHTON (J. E.) & COOPER (G. F.). **Mycosis of the Hands and Feet.**—*U.S. Nav. Med. Bull.* 1924. Nov. Vol. 21. No. 5. pp. 615–630. With 13 figs. [10 refs.]

This communication is based on the answers received to a questionnaire concerning any mycotic infection addressed to 500 persons of all ranks under the observation of the U.S. Naval Medical Service, which answers are recorded in numerical tables and charts. A majority of the cases giving a history of infection of the hands and feet had served on tropical duty, the largest percentage of this group occurring among officers and the men of the Hospital Corps. Only sixteen cases of the five hundred had active lesions at the time of this investigation; these were of the vesicular, squamous, hyperkeratotic and intertriginous varieties. Emphasis is laid upon the importance of examining the roofs of vesicles for the demonstration of the fungus. The cultures so far identified were those of *Epidermophyton cruris, Microsporon audouini* and *Trichophyton asteroides.* (The general cultural and morphological characteristics of tinea fungi are very briefly described.) Complement fixation and agglutination tests were all negative. For treatment tincture of iodine, potassium permanganate solution followed by hydrogen peroxide in acid solution to remove staining, and linimentum saponis are put forward as the most beneficial medicaments for local application.

W. J. O.

MONTPELLIER (J.). **Efflorescences cutanées chez les vieux faviques. La question des "favides."**—*Bruxelles Méd.* 1924. Nov. 9. Vol. 5. No. 2. pp. 48–51. [1 ref.]

The polymorphic eruption, occurring more especially on the trunk and upper limbs, of long standing favus cases in Algeria is described. This consists of (1) small rose spots with some scaling and pustulation, which about the hair follicles become papular or spinular; (2) larger erythematosquamous macules which on resolution may leave leucodermic spots. Such cases only occasionally are observed with generalized favus cups. The scales from these lesions, prior to the fading stage, show Achorion fungus; the eruption is therefore considered to be identical with that described by other writers under the designation favus herpeticus or trichophytoide. Comparison is drawn between these favides and the trichophytides, and a partial allergic reaction in association with external infection of the fungus is suggested as the causative factor. The hope of appropriate vaccine therapy being introduced is put forward.

W. J. O.

DE VRIEZE (T. J.). **Favus in Indië.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 726–727.

Quotes an experience in which a European woman and her two children were found to be suffering from favus. The mother had been previously suffering from it in Europe. The fungus can apparently remain active and be transmitted under tropical conditions, though it is not endemic in Java.

W. J. Bais.

SOETOMO (R.). **Microsporie bij Javaansche kinderen en hare epidemiologie.** [Microsporia in Javanese Children and its Epidemiology.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 720–725. With 2 figs.

Soetomo saw three cases of microsporia in Javanese children. It is known that imported domestic animals are infected with this dermatomycosis. Infection of native domestic animals from this source may give rise to human cases, and the author emphasizes the necessity of preventive action of the veterinary service in this respect.

W. J. Bais.

CASTELLANI (Aldo). **Notes on Pruritus Ani of Mycotic Origin.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 15. Vol. 27. No. 22. pp. 304–305. [1 ref.]

Eleven cases of pruritus ani, out of 54 cases examined, showed the presence of a fungus; two of these had at the same time dermatitis interdigitalis pedum (mango toe), while six gave a history of having previously suffered from dhobie itch. For local treatment Deeks' ointment is recommended, viz, Ac. salicyl. 4, bismuth. subnit. 10, hyd. salicyl. 4, oil of eucalyptus 10, vaseline and lanolin q.s. to 100 parts.

W. J. O.

VILLALONGA (Jayme). **Dois casos de blastomycose cutanea.**—*Arch. Brasileiros de Med.* 1924. Sept. Vol. 14. No. 9. pp. 549–557. With 5 figs.

The first patient was a woman, 21 years of age. The condition started five years previously as a bright red papulo-squamous eruption which gradually spread from the nostrils over the upper lip; it was painless and but slightly itching. In Feb. 1923 scales were sown on Sabouraud's medium and in two months a rugose, crateriform, yellow culture was obtained. Treatment by iodine locally and iodide of sodium intravenously proving ineffectual, radio-therapy was tried with excellent results.

The second was a man of 24 years. A red spot high up on the internal aspect of the thigh extended till, in six weeks, a papular erythematous patch covered the adjacent part of the scrotum. A culture was obtained from this case also and was inoculated in the skin of the abdomen of a white rat. Ten days later the site was not healed, and the right inguinal glands were swollen. Nearly six months later the inoculated animal died and post-mortem an advanced endocarditis was found and yellow nodules the size of rice grains scattered in the lungs, some of them caseating.

This patient's condition was treated with xylol, 20 drops, in vaseline, an ounce; later with Lugol's solution 3 parts to 1 part of glycerine, and the lesion cleared in 40 days.

H. Harold Scott.

CASTELLANI (Aldo). **A New Type of Blastomycosis Cutis: (Furunculosis Cryptococcica, Folliculitis Decalvans Cryptococcica).**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp. 326–328. With 1 fig.

Report of a case of folliculitis decalvans of the scalp from the pustular lesions of which, in addition to *S. aureus*, a Cryptococcus was demonstrated culturally (on glucose agar) as an abundant white growth becoming yellowish later and showing a yeast-like organism on microscopical examination. This was agglutinated by the patient's serum in high dilution (1 in 400). Healing was obtained by injections of cryptococcus vaccine and by massive doses of potassium iodide, though staphylococcus vaccine had been given previously without any beneficial effect.

W. J. O.

RODRIGUEZ ARJONA (Vicente). **Contribución al estudio de las enfermedades tropicales. El "Mal del Pinto" de la peninsula de Yucatan.** [Contribution to the Study of Tropical Diseases. "Pinto" in Yucatan.]—*Rev. Méd. et Hyg. Trop.* 1924. May–July. Vol. 16. No. 5. pp. 142–150. With 2 figs. [9 refs.]

"Pinto" in Yucatan as described in this paper is always the white variety, and differs from the chromogenic forms in that there is no itching, no excoriation, and no desquamation. The patches appear suddenly and progress, sometimes very slowly, fresh spots developing for years and coalescing to produce large white "geographical" areas; at other times they may become arrested early. They may be seen on any part of the body. The skin is smooth and the cutaneous functions are unimpaired, though the parts affected are more sensitive than normal to heat or to the prick of insects. They persist throughout life. No parasite has been found, and examination of scrapings of the skin reveals nothing abnormal, and no treatment is of any avail. The author thinks that the cause may be some fungus involving the deeper layers of the skin and originating from the almost exclusive use of maize in the diet of the people.

H. Harold Scott.

CATSARAS (Joh.). **Ueber einen Fall von indischen Maduraarm (Mycetoma brachii).** [A Case of Indian Madura Arm.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1924. June 6. Vol. 250. No. 1–2. pp. 244–251. With 3 text figs. [10 refs.]

Attention is drawn to the numerous cases of mycetoma observed outside tropical countries, of which cases 15 had been reported to 1917. In all six cases had been observed in Greece, of which four showed *Streptothrix madurae* and two an *Aspergillus*. This paper concerns the preserved amputated left arm (sent from Calcutta) of a 30 years' old Hindu woman, in whom the disease had been of 11 years' duration. The greatest thickening of the limb was about the elbow region, declining gradually towards the arm and forearm. The hand was completely free and its softness in obvious contrast to the swelling of the forearm. The most numerous lesions were about the posterior aspect of the elbow and on the ulnar surface of the forearm. The bones

showed porosis and sclerosis; the elbow joint was ankylosed. The whole musculature about the elbow joint was for the most part replaced by masses of hard greyish-white connective tissue. The histological picture of the skin is described, as are also the changes observed in the deeper tissue and bones, which latter showed no evidence of caries. While the nature of the fungus obviously could not be established, the microscopical picture suggested a streptothrix which did not entirely conform to the description of *Streptothrix madurae* of Vincent.

W. J. O.

AUDRAIN (L. C.). **A Case of Mycetoma.**—*Jl. Amer. Med. Assoc.* 1924. Oct. 11. Vol. 83. No. 15. p. 1165. [1 ref.]

Report from Mexico of a case in a youth, aged 18. Six injections of neoarsphenamin produced no improvement. Later eighteen intravenous injections of 10 cc. 1 per cent. mercurochrome-220 soluble and neoarsphenamin 0·75 gm. in alternate weeks caused healing of the sinuses and disappearance of the swelling, the foot becoming freely movable. In an interesting note attention is drawn to the natives' superstition regarding this disease.

W. J. O.

MONTPELLIER (J.). **Deuxième cas algérien de mycétome du pied (type "pied de Madura"), dû à l'*Aleurisma apiospermum*.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 755–757.

Mycological report of the morphology and cultural characteristics of a fungus obtained from a case of mycetoma not described. The observation that the addition of a decoction of eucalyptus leaves to all the culture media exerted a preventive action is noted, with the suggestion of its possible therapeutic value.

W. J. O.

BURNET (Et.), BROC (R.), BRUN (G.) & JAMIN (H.). **XIIIe observation tunisienne de mycétome. Extension de l'infection aux ganglions cruraux inguinaux et iliaques.**—*Arch. Inst. Pasteur de Tunis.* 1924. Oct. Vol. 13. No. 3 & 4. pp. 306–309. With 2 figs. [2 refs.]

Report of a case, male, of 4 years' duration, due to infection of Nocardia, commencing as warty lesions on the plantar aspect of the left foot. Six months previous to coming under observation the inguinal glands (left) had become enlarged and there now showed a mass of multiple painless swellings in Scarpa's triangle in various stages of softening and fluctuation, with cutaneous lesions resembling those on the foot. In addition there were two discrete cutaneous tumours on the thigh. Surgical exploration revealed infection of the iliac glands. Cultures from all lesions examined gave the same Nocardia fungus without any secondary bacterial contamination. Examination of an inguinal gland showed the presence of fine filaments without any "club" elements. The authors had been able to find recorded in the literature only two observations of extension by the lymphatics giving rise to similar metastatic infective lesions.

W. J. O.

REMLINGER (P.). **Sur la fréquence des staphylococcies cutanées à Tanger.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 757–761. [4 refs.]

The remarkable frequency of cutaneous staphylococcal affections occurring among all classes of society in Tangiers is noted. Two factors are considered to be mainly responsible: (1) the primitive sanitary arrangements, combined with the customary sweeping of the streets during the hottest hours of the day, and (2) the frequent and violent winds. Under the existing conditions preventive measures lie in the avoidance of any form of skin irritation, in the careful washing of the clothes, and in suitable dieting.

W. J. O.

CUNNINGHAM (J.) & RAMAKRISHNAN (S.). **A Note on the Cause of Pemphigus Contagiosus (Manson).**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 559–560. [4 refs.]

This condition of pyosis mansoni is characterized by a papular eruption, becoming first vesicular and rapidly pustular, with a well-marked reddish ring and little crust formation. The lesions are distributed mainly on the extremities and less commonly in the axillae. A haemolytic streptococcus, isolated from the early vesicles, showed the cultural fermentation reaction of *S. subacidus* of HOLMAN's classification. The aurococcus (WINSLOW and ROGERS) is considered to be a secondary contamination. Vaccine (streptococcus) therapy gives unfailing beneficial results.

W. J. O.

DELANOË, Mme. **Sur un cas d'aïnhum chez une femme marocaine.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 482–484. With 1 text fig. [4 refs.]

Case report concerning a woman in whom the condition was of 15 years' duration. Examination of the amputated stump showed marked rarefaction of the bones. This deformity is considered to be due to vascular obliteration following the inflammatory changes of some initial trauma.

W. J. O.

WELCH (R. S. G.). **Ainhum.**—*U.S. Nav. Med. Bull.* 1924. Sept. Vol. 21. No. 3. pp. 352–355. With 1 plate.

Two cases are reported from St. Croix, the second of these being more particularly interesting as the condition was in a comparatively early stage. About one year previous to her coming under observation this negress, aged 46 years, had begun to experience pain, at first intermittent to become constant, in the left little toe, At the same time she noticed a constriction at the base of the same toe, which was slightly swollen and enlarged on the distal side of the constriction and showed slight impairment of tactile sensibility. "X-ray examination of left foot: Atrophy of shaft of proximal phalanx of left little toe, with thinning of cortex. No other bone pathology." There was no

positive family history or clinical and laboratory evidence of other disease. Disarticulation at the metatarso-phalangeal joint was performed. The theory of a trophoneurotic etiology, possibly combined with some traumatic element, is suggested for this case.

W. J. O.

VALERIO (Americo). **Sobre um caso de "ainhum."**—*Arch. Brasileiros de Med.* 1924. Oct. Vol. 14. No. 10. pp. 605–608.

Two cases are here mentioned; in one the toe condition began six years previously, and the patient had also suffered from caries of the spine for two years. There was free mobility of the toe, but the digit was exquisitely painful and tender to touch, especially in the sulcus. In a second case the condition was symmetrical in both feet and there was some doubt in the author's mind whether it was not a case of symmetrical gangrene. This is interesting in view of the fact that Professor Pereira GUIMARÃES has previously compared ainhum with Raynaud's disease.

H. Harold Scott.

BEVEN (J. O.). **Ainhum in a Supernumerary Digit.**—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. p. 250.

This brief note mentions the occurrence of vigorous bleeding from the apparently normal artery severed when amputating the finger, showing that the condition is not due to an endarteritis obliterans.

W. J. O.

JEWELL (N. P.). **A Case somewhat resembling Ainhum.**—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. pp. 250–251.

Case report of a native showing necrosis of the first phalanx of the left great toe with the normal interphalangeal groove on the plantar aspect extending into the joint which was completely destroyed. Apart from this groove the skin of the toe was apparently healthy and sensitive. On the right foot the skin of the corresponding groove showed chronic inflammation with a small amount of granulation tissue and serous discharge, which change was apparently confined to the skin. No history could be obtained. Unlike the lesion of ainhum, in this case the constricting groove was only on the plantar aspect of each affected toe.

W. J. O.

KANDELAKI (S.). [**Ulcus tropicum phagedenicum im Kaukasus.**]—*Mediz. Sbornik Sakawkasja.* 1923. No. 1. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 300.]

This condition was observed in about 10 per cent. of ambulatory patients in a village near Baku, and during the famine appeared as an epidemic among the anaemic and malaria patients, especially among those walking bare-footed. The disease occurred in the warm marshy districts of the Caucasus, more particularly in the season corresponding to the increase of blood-sucking insects.

W. J. O.

HOUSSIAU. **Traitement de l'ulcère phagédénique tropical per les injections intramusculaires de sels de bismuth.**—*Bruxelles Méd.* 1924. Sept. 21. Vol. 4. No. 72. pp. 1354–1356. With 1 fig.

Report of a case of 3½ months' duration, previously treated with local caustics and neosalvarsan injections without result, which almost completely healed after three intramuscular injections in successive days of 3 cc. succinate of bismuth followed by two further injections at 2 and 3 days' intervals. Local applications of bismuth hydroxide in oily suspension were employed concurrently.

W. J. O.

SCHOCHET (S. S.). **Granuloma Inguinale with the Report of a Case observed in Chicago.**—*Surgery, Gynecology & Obstetrics.* 1924. June. Vol. 38. No. 6. pp. 759–767. With 4 text figs. [46 refs.]

A case of granuloma inguinale of 5 years' duration and successfully treated with antimony injections is reported. A general account of the disease is given. One point in the differential diagnosis is emphasized—that this condition is never associated *per se* with general adenopathy. PRESTLEY's warning that prolonged use of antimony produces fatty degeneration of the liver, kidney, heart and muscular tissue of the diaphragm is quoted. It is suggested that granuloma inguinale be made a notifiable disease, since 66 cases (45 males, 21 females) have been reported in the United States during the past three years.

W. J. O.

MURDOCK (T. P.). **Report of Case of Granuloma Inguinale.**—*Boston Med. & Surg. Jl.* 1924. Sept. 18. Vol. 191. No. 12. pp. 539–540. [10 refs.]

Report of a case in a man, aged 28 years, in whom the skin lesions had appeared one month after exposure to infection by sexual intercourse. He had never been to the tropics. There was no sign of any other associated condition or history of trauma. Donovan's organisms were observed in smears obtained from the lesions, which healed under specific treatment by intravenous injections of tartar emetic. This is said to be only the second case reported from Connecticut.

W. J. O.

RANDALL (Alexander). **Two New Antimony Compounds for Intravenous Use. A Study of their Therapeutic Value in Cases of Granuloma Inguinale.**—*Amer. Jl. Med. Sciences.* 1924. Nov. Vol. 168. No. 5. (No. 632). pp. 729–749. [73 refs.]

Ten cases of granuloma inguinale are reported. Of these 5 were treated with intravenous injections of triamide of antimony thioglycollic acid (T.A.T.) in 0·4 per cent. sol., 2 with sodium antimony thioglycollate (S.A.T.) in 0·5–1 per cent. sol., and 3 with injections of both preparations. Healing occurred in 9 of these patients, none of whom showed any ill effects of antimony poisoning, though 5 of the cases treated had previously shown intolerance to tartar emetic. The

chemistry of these compounds is discussed and the experimental estimation of their lethal dosage compared with that of tartar emetic. S.A.T., with the highest antimony content appears to be the least toxic of the 3 antimony preparations and is of higher solubility than T.A.T. which cannot therefore be used in such concentrated doses. It is advised that these synthetic preparations be given every second day and that at least 12 further injections be given after the first healing has taken place; subcutaneous and intramuscular injections appeared to cause pain.

W. J. O.

THIERFELDER (M. U.). **De oorsprong van het venerisch granuloom en de oorzaken der granuloomepidemie op Nederlandsch Zuid-Nieuw-Guinea.** [The Origin of Granuloma Venereum and the Causes of the Granuloma Epidemic in Southern Dutch New Guinea.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 838–843.

Europeans as well as natives are convinced that granuloma venereum had been imported into the island since its occupation. This opinion may be accounted for by the erroneous identification of the disease with syphilis. No foreigners, however, are known to have been infected with granuloma. Before the epidemic outbreak cases are known to have occurred in villages far from the occupied parts of the island. The affection appears to be a specifically tropical venereal disease, perhaps endemic in all tropical countries.

The author thinks that the following factors explain the epidemic outbreak. Before medical treatment could be obtained by the natives the affected individuals shortly after the onset of the disease were excluded from sexual intercourse by the rapid destruction of the genital parts; thus the spreading of the disease was restricted. Medical treatment, though not effecting a real cure, resulted in a decreased virulence of the affection in many patients, who subsequently contributed to the spread of the disease. The comparative safety after the occupation and the more intensive communication between the villages since is another factor.

W. J. Bais.

JUNÈS (E.) & BUCKWELL (P.). **Chronique du** *Xeroderma pigmentosum* **en Tunisie. Xe observation (14e cas) de** *Xeroderma pigmentosum* **observé en Tunisie** [JUNÈS & BUCKWELL]; **XIe observation (cas 15 et 16) de** *Xeroderma pigmentosum* **observé en Tunisie** [JUNÈS); **XIIe observation (17e cas) de** *Xeroderma pigmentosum* **observé en Tunisie** [JUNÈS & BUCKWELL].—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 226–232. With 1 plate. [4 refs.]

Reports of three clinically typical cases of xeroderma pigmentosum. Report No. 11 (case 15) concerned a congenital syphilitic child, aged 8 years, with tertiary cutaneous and ocular lesions and a positive Wassermann reaction. Report No. 12 (case 17) is of interest in that the patient was a man, aged 60–70 years, in whom the skin condition dated from the age of two years, while the skin tumours had been first observed after his fiftieth year.

W. J. O.

CANGE (A.) & ARGAUD (R.). **Nodosités juxta-articulaires, pian et syphilis.**—*Arch. Inst. Pasteur d'Algérie.* 1924. June Vol. 2. No. 2. pp. 196–199. [1 ref.]

The main interest of this short contribution (to confirm the syphilitic etiology of juxta-articular nodules) lies in the abstracts quoted from the medical literature of 1838 and 1842 describing the occurrence of yaws in Algeria, in contradistinction to its rare incidence at the present time in the experience of Cange and Argaud and of other medical officers in the country from whom information was sought on this particular circumstance. It is suggested that the writers of these early communications may have confused the framboesiform lesions of syphilis with those of yaws.

W. J. O.

GOUGEROT & LE CONIAT. **Nodosités juxta-articulaires syphilitiques des deux genoux chez une française n'ayant jamais quitté la France.** *Bruxelles-Méd.* 1924. June 26. Vol. 4. No. 59. pp. 1057–1059. With 1 fig. [2 refs.]

Case report concerning a woman, aged 62 years, with the lesions in question of some few months' duration and with ulceration of three of them. Complete resolution of all nodules followed sulfarsenol treatment. The title of this communication explains the chief interest of the case.

W. J. O.

JESSNER (Max). **Ueber juxtaartikuläre Knotenbildungen.**—*Klin. Woch.* 1924. Aug. 12. Vol. 3. No. 33. pp. 1499–1501. [61 refs.]

A comprehensive general account of the lesions which in the writer's opinion owe their origin to probably more than one pathological factor. A useful bibliography is added.

W. J. O.

CARTER (F. R.). **Granuloma Inguinale. Report of a Case; a Review of the Literature; and Comments suggested by a Review of all Cases reported to date.**—*Urologic & Cutaneous Rev.* 1923. Sept. Vol. 27. No. 9. pp. 539–546. [40 refs.]

GOODMAN (Herman). **Ulcerating Granuloma (Granuloma Inguinale). A Pictorial Presentation of Tropical and Temperate Zone Experience.**—*Urologic & Cutaneous Rev.* 1923. Feb. Vol. 27. No. 2. pp. 86–92. With 31 figs.

RABIES: A REVIEW OF RECENT ARTICLES. II.*

The literature on Rabies published during the last six months is varied in character. Though nothing of startling importance has emerged from the various researches which have been undertaken, there is yet record of valuable experimental work on the one hand, and of useful practical application on the other. To the former class belongs the work of REMLINGER & CURASSON[1] proving the identity with rabies of Oulou Fato—a disease of dogs which is prevalent in Northern Africa, and the work of IMAMURA & ANDO[2] on the cultivation of the virus. Amongst the latter may be included the extension of prophylactic vaccination of dogs against the disease, as a measure of epidemic control, in Japan[3], in the States of Connecticut[4] and Massachusetts[5], and in Barcelona[6]. A number of general articles have been published, as is to be expected in the case of a disease regarding which there is much ignorance and apathy, even amongst the medical profession. JEUNHOMME[7] contributes an instructive editorial to the *Presse Médicale* on the early history of the disease. MARTI[6] discusses recent work on etiology and prophylaxis, and MICHALKA[8] writes a general essay on the diagnosis of rabies in animals. REMLINGER[9] summarizes the advances which have been achieved during the last ten years. FERMI[10] publishes a brochure comparing in the fullest detail his own method with all other existing methods. It is to be regretted that there is so much evidence of provincialism in the writings of many authors on rabies. The dried cord school ignores the existence of those who use carbolized vaccines and *vice versa.*

It is unfortunate that the name of PASTEUR should be associated with a particular technique of treatment. The vaccinal treatment of the disease is due to PASTEUR, and to him alone. His was a far larger

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* For the first of this series see Vol. 21, pp. 708–714.

1 REMLINGER & CURASSON. Identité de l'Oulou Fato (maladie du chien fou de l'Ouest africain) et de la rage.—*Bull. Acad. Méd.* 1924. Nov. 11. 3rd Ser. Year 88. Vol. 92. pp. 1112–1117.

2 IMAMURA (Arao) & ANDO (Keisaburo). On the Behaviour of Rabies-Virus in Vitro.—*Scientific Reports from Govt. Inst. for Infect. Diseases.* Tokyo. 1923. Vol. 2. pp. 357–365. (9 refs.)

3 HATA (S.). The Protection of Dogs against Rabies by Umeno's Method of Preventive Inoculation.—*Jl. Immunol.* 1924. May. Vol. 9. No. 3. pp. 89–93.

4 CORWIN (George E.). The Control of Rabies in Connecticut.—*Amer. Jl. Public Health.* 1924. Aug. Vol. 14 No. 8. pp. 688–692.

5 BIGELOW (George H.) & WEBBER (Wolfert G.). Rabies: a Community Problem.—*Boston Med. & Surg. Jl.* 1924. Sept. 25. Vol. 191. No. 13. pp. 582–585. With 2 figs.

6 SALVAT MARTI (José). Los nuevos estudios acerca de la etiologia y profilaxis de la rabia.—*Rev. Espanola Med. y Cirug.* Barcelona. 1924. Oct. Vol. 7. No. 76. pp. 593–595. (1 ref.)

7 JEUNHOMME (P.). A propos de la rage: vieille histoire.—*Presse Med.* 1924. Sept. 13. Vol. 32. No. 74. Supplément. pp. 1551–1554.

8 MICHALKA (J.). Die Diagnose der Wut bei Tieren.—*Seuchenbekämpfung.* Vienna. 1924. Vol. 1. No. 5–6. pp. 147–152.

9 REMLINGER (P.). Les travaux sur la rage pendant ces dix dernières années.—*Arch. Inst. Pasteur de Tunis.* 1924. Oct. Vol. 13. No. 3 & 4. pp. 310–350. (186 refs.)

10 FERMI (Claudio). I metodi Fermi di vaccinazione e di siero-vaccinazione antirabbica confrontati con tutti gli altri metodi esistenti. Studio critico sperimentale.—146 pp. Pubblicato per cura dell' Istituto Sieroterapico Milanese.

concept, and we make bold to state that he would have been the first to accept any modification of technical detail, which, in the light of further discovery, might have proved to be advantageous. It might be preferable to speak rather of Pasteurian treatment (var. HÖGYES, FERMI, or dried cord, as the case might be.)

Mutation of the Virus.—NICOLLE & BURNET[11], following LEVADITI, NICOLAU & SCHOEN (this *Bulletin*, Vol. 21, p. 708 (ref. 3)) have attempted to reverse the alteration of street virus into fixed virus, which is brought about by passage in rabbits. They aim at achieving this object by passaging fixed virus through dogs. They are now at the eleventh passage, and no modification has occurred, either in the clinical character of the disease, or in the reappearance of Negri bodies. The authors start from the assumption that the nature of the virus depends upon the species of animal in whose tissues it is grown. If, as others hold, the tissue and not the species of animal is the influencing factor (*i.e.*, F.V. is a brain virus, whereas S.V. has to make its way through various tissues), then this experiment is not likely to lead to the desired result.

LEVADITI, NICOLAU & SCHOEN [12] consider that fixed virus is neurotropic, and that this faculty is attained by mutation. The rate of mutation varies with the number of Negri bodies which the original street virus brain contains. Viruses which were poor in Negri bodies quickly became fixed—and *vice versa*. The mutation was found to oscillate, and is ascribed to the influence of two factors—the intrinsic character of the strain and the sensitivity of the animal inoculated. They found no absolute relation between the period of incubation and prevalence of Negri bodies, though in any one strain there was an association between these two characters.

Diffusivity and Cultivation of the Virus.—IMAMURA & ANDO[2] set themselves two problems : (1) Does the virus, when a virulent medulla is brought in contact with a fluid medium, diffuse into that medium ? and (2) How long does such a virus maintain its virulence in various fluid media ? The media employed were inactivated horse serum, rabbit plasma in normal saline, Ringer's solution, culture broth, distilled water, and glycerine diluted with 2 vols. of normal saline. The experiments were carried out at 37°C., under anaerobic conditions. Out of 262 animals, 116 contracted disease when inoculated with portions of medulla which had been kept in one or other of the above media. None of the animals inoculated with the fluid media developed rabies. In these experiments the authors claim that the virus does not diffuse (*cf.* REMLINGER, various notes in the *Comptes Rendus de la Société de Biologie* from 1917 to 1918, and *Annales de l'Institut Pasteur*, 1919, p. 28). Incidently, they found that the best of the above fluid media for preserving the virus in solid medullae was rabbit plasma (citrated to contain 0·5 per cent. sodium citrate), diluted with an equal part of physiological saline solution. In this the medulla remained virulent for 15 days, whereas in the glycerine solution it was potent for 6 to 7 days only.

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11 NICOLLE (Ch.) & BURNET (Et). Sur la restauration du virus fixe.—*C. R. Soc. Biol.* 1924. July 11. Vol. 91. No. 24. pp. 366–368.

12 LEVADITI (C.), NICOLAU (S.) & SCHOEN (R.). Antagonisme entre le virus rabique fixe et le virus des rues ; mécanisme de la mutation du virus des rues en virus fixe.—*C. R. Soc. Biol.* 1924. July 18. Vol. 91. No. 25. pp. 423–426. (3 refs.)

They then turned their attention to cultivation of the virus, and investigated media containing 0·3 to 0·45 per cent. Na. Cit. diluted with one to four times its volume with saline solution. The solid substratum of the culture medium was a portion of normal rabbit's medulla. Subsequently test inoculations were made from the piece of normal medulla, and from the fluid medium. In 12 out of 14 cases the medulla had become infective, and in no case did the surrounding fluid convey infection. They conclude that the virus requires living tissue for its multiplication, and that there is no evidence of diffusion into the fluid, or of multiplication in any of the fluid media which they investigated. This confirms the work of VOLPINO (*Presse Medicale*, 1914, p. 79), and of KRAUS & BARBARA (*Presse Medical*, Argentina, 10th June, 1914), and appears to shed considerable light on the vexed question of the cultivation of the virus.

CARONIA & SINDONI[13], on the other hand, recognised a minute micro-organism—at the limit of visibility—which was gram positive, and stained with Löffler's blue in Tarozzi-Noguchi cultures of fixed virus. These bodies were identical with those they observed in the medulla of fixed virus rabbits, and in a child's brain. Inoculation with the fluid medium from the first to the sixth generation conveyed the disease.

Experimental rabies in animals.—BEDIER & CHASSIGNEUX[14], in the course of passaging the virus in use at Dakar, experienced difficulties due to (1) early deaths of rabbits after intracranial inoculation, (2) failures in the conveyance of infection, and (3) the occurrence of abnormal cases in which torticollis and chorea were a symptomatic feature. The virus was in its 39th passage, and the accidents occurred only in months of August and September, 1922, and September and October of 1923.

ARLOING & THÉVENOT[15] describe experiments in which rabies was conveyed to guineapigs by inoculation into the cavities of the heart, and into the muscles of the neck.

Preservation of the Virus.—We have already referred to the work of IMAMURA & ANDO[2] on rabbit plasma. REMLINGER[16] has examined the qualities of oil to which camphor has been added (L'huile camphrée), as a preservative. The results were good, but the camphor caused symptoms of irritation in animals inoculated, which limit its application—*inter alia* he states that a medulla keeps its virulence for 40 days in talc, for 50 in powdered sugar, for 61 in sea salt, and for 72 in a sterilized glass vessel.

PUNTONI[17] has found that the keeping properties of the virus in glycerine is profoundly influenced by the temperature. At 37°C. it

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13 CARONIA (G.) & SINDONI (M. B.). Ricerche sulla etiologia della rabbia. Nota preventiva.—*Pediatria.* 1924. July 15. Vol. 32. No. 14. pp. 817–823. With 1 plate.

14 BÉDIER (E.) & CHASSIGNEUX (A.). Au sujet de quelques accidents observés à Dakar au cours des passages de virus rabique. *Bull. Soc. Path. Exot.* 1924. Vol. 17. No. 6. pp. 511–514. With 1 text fig.

15 ARLOING (Fernand) & THÉVENOT (Lucien). Sur la rage expérimentale du cobaye.—*Rev. Path. Comp. et Hyg. Gén.* 1924. Aug. 5–20. Vol. 24. No. 258–259. pp. 543–544. (3 refs.)

16 REMLINGER (P.). Conservation du virus rabique dans l'huile camphrée.—*C. R. Soc. Biol.* 1924. July 11. Vol. 91. No. 24. pp. 350–351. (2 refs.)

17 PUNTONI (Vittorio). Effetti dells glicerina e del freddo sulla sopravvivenza e sul periodo di incubazione del virus rabico.—*Ann. d' Igiene.* 1924. Oct. Vol. 34. No. 10. pp. 716–721.

is almost destroyed, whereas at 0°C. street virus preserves its virulence for thirteen months, and fixed virus for fifteen months. He observed also that keeping in glycerine at 0°C. has the effect of shortening the incubation period. This he ascribes not to an alteration in the rate of multiplication of the organism, nor to the presence of antagonistic substances which are destroyed by the glycerine, nor to the formation of aggressins, but to a modification of the virus itself, which, however, is not transmitted to the next passage.

Diagnosis. (1).—*The Staining of Negri Bodies.*—ADRIANI[18] uses the following method:—

Fix in acetone 1–2 hours. Xylol ½ hour. Xylol and paraffin ½ hour. paraffin 1 hour—cut—Xylol—abs. alc. Then stain for 5 to 10 minutes in

Malachite green	20 cgm.
Orange G.	2 gm.
90 per cent. alcohol	10 cc.
Distilled water	105 cc.

The section is then placed without washing for 2 to 3 minutes in

Chromic acid	50 cgm.
Potass. Alum.	1 cgm.
Distilled Water	100 cc.

Washed 20 seconds and carried through as usual. The Negri bodies appear green on an orange ground. Internal vacuoles and corpuscles of Volpino are seen. The method is claimed to be more rapid and less difficult than that of MANN and the preparations have very good lasting properties.

GALLEGO[19] describes a method of staining which, from the illustrations reproduced in his paper, appears to give good results. He fixes in 10 per cent. formaldehyde (46 hours at 37°, 24 hours in the cold or 21 minutes in urgent cases).

The tissues are cut by a freezing microtome, and not in paraffin, the reagents used are

(*a*) Nitro-ferric solution:	
Aq. dest.	10 cc.
Nitric acid	1 drop.
Perchloride of iron (Poulenc or Merck) diluted in water to 10 per cent. ...	1 drop.
(*b*) Carbol-fuchsin solution:	
Aq. dest.	10 cc.
Ziehl's carbol-fuchsin	15 drops.
Acetic acid	1 drop.
(*c*) Nitro-ferric formol:	
Aq. dest.	10 cc.
Formol	2 drops.
Nitric acid	1 drop.
Perchloride of iron diluted to 10 per cent.	1 drop.

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18 ANDRIANI (S.). Méthode simple et rapide pour mettre en évidence les corps de Negri dans la rage.—*Ann. Inst. Pasteur.* 1924. June. Vol. 38. No. 6. pp. 520–522. With 1 fig.

19 GALLEGO (Abelardo). Contribución al diagnóstico histológico de la rabia Método rápido, sencillo y seguro para la coloración de los corpúsculos de Negri en los cortes.—*Rev. Hig. y Sanidad Pecuarias.* Madrid. 1924. Aug. Vol. 14. No. 8. pp. 499–502. With 2 figs.

(*d*) Picro-indigo-carmin : according to the formula of Cajal—
10 per cent. watery solution of indigo-carmin ... ... } equal parts.
Saturated watery solution of picric acid }

The procedure is as follows :—

1. Fix in 10 per cent. formol for 21 minutes.
2. Cut frozen sections.
3. Sensitize in solution (*a*) for half to one minute.
4. *Without washing* stain in (*b*) for 5 minutes.
5. Wash in water.
6. Place in solution (*c*) for 5 minutes and wash in water.
7. Stain with (*d*) for one minute, again wash.
8. Dehydrate in 95 per cent. alcohol.
9. Clear in carbol xylol (5 per cent.) or in bergamot oil.
10. Mount in Canada balsam.

Nuclei stain violet, protoplasm azure or green azure, the homogeneous substance of the Negri bodies green or rose-green, and the inner formations a pale violet.

A faster modification is to use a stronger solution of carbol-fuchsin (30 drops in 10 cc. aq. dest.) for one minute, and to use solution (*c*) for one minute only.

2. *Inoculation by Lumbar puncture.*—LAPPONI[20] uses lumbar puncture for animal experiment. Difficulties due to regurgitation are removed, and time is saved as the incubation period is shorter than after subdural inoculation. The onset of symptoms with 27 strains of street virus (examined by both methods) was as follows :—

Subdural.		*Lumbar.*	
Days after inoculation.	Number of animals showing 1st symptoms.	Days after inoculation.	Number of animals showing 1st symptoms.
11	1	9	2
13	1	10	5
14	1	11	12
15	3	12	5
16	5	13	3
17	12		
18	3		
24	1		

Thus, amongst the 27 strains, the mean incubation period after subdural inoculation was 16½ days, whereas after inoculation by lumbar puncture it was only 10 2–3 days. Also the variability of the incubation periods was much reduced.

Variations of street virus.—REMLINGER[21] describes a street virus of a very potent character. It was obtained from a fox eighteen months old which died of classic paralytic rabies of maxillary type. A rabbit inoculated with this strain became ill on the eighth day and died on the

[20] LAPPONI (D.). Inoculazione endorachidea del virus da strada nella diagnosi biologica della rabbia.—*Ann. d' Igiene.* 1924. July. Vol. 34. No. 7. pp. 492–496.

[21] REMLINGER (P.). Sur un virus de rue renforcé recueilli au Maroc.—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 538–539. (2 refs.)

ninth day. Deaths occurred in successive passages on the 8, 7, 7, 8, 6, 7, 7 and 6th days respectively. The duration of illness in each case was one day.

Under this heading we may also refer to the work of REMLINGER & CURASSON[1] upon the identity with rabies of Oulou Fato—a disease of mad dogs which occurs in West Africa and in the Sudan. The disease has been recorded since 1815. It is said to be transmissible from dog to dog, but not from dog to man—apart from this it has the characters of dumb rabies. A virus was obtained and subpassaged—it gave incubation periods of from 15 to 17 days. Successive passages were carried out. The behaviour of the virus was identical with that of rabies. Cross immunization and inoculation experiments were carried out with this and the virus mentioned in the preceding paragraph. The two were identical. The authors conclude that persons bitten by a dog suffering from this disease should be sent for treatment without delay.

Epidemiology.—The increased prevalence of rabies in Tchecoslovakia is a matter of concern (MARX[22]). This is particularly marked in the provinces of Böhmen (802 rabid dogs in 1921, as compared with 1,675 in 1922), and of Mähren (322 as compared with 621). Human cases have also approximately doubled during this period, and the number of patients receiving treatment at the Pasteur Institute at Weinberge has similarly increased.

CORWIN[4] in dealing with an epidemic in the State of Connecticut has made important observations on the potency of individual dogs as disseminators of the disease. His table may be reproduced in full. It describes the depredations committed by individual dogs, whose course was traced in detail.

Starting point.	Miles travelled.	Number of dogs known to have been bitten.
Suffield	15	27
East Windsor	7	12
South Windsor	10	7
Vernon	30	7
Somers	40	12
Manchester	18	9
Old Lyme	12	4
Norwich	15	15

Thus the average excursion amongst these dogs was 18 miles, and in one case it was as much as 40—and the average number of new foci which might later become active was 12 from each dog.

BIGELOW & WEBBER[5] state that this epidemic has spread into Massachusetts. Maps are printed which show the localization of rabies in the N.E. corner of the State in 1923, whereas in 1924 it has diffused westwards.

Control of rabies by the prophylactic vaccination of dogs.—A number of papers have been published upon this very important subject. It centres upon the question whether a significant protection against

22 MARX (Anton Maria). Die gerichtsärztliche Beurteilung von Lyssafällen. Gleichzeitig eine Mitteilung ueber die Ausbreitung der Lyssa in der tschechoslowakischen Republik.—*Med. Klin.* 1924. Sept. 14. Vol. 20. No. 37. (1031). pp. 1287–1290. (7 refs.)

rabies infection can be achieved by the administration of a single dose of a rabies vaccine. An excellent review of the present situation is published in the *Revista de Medicina Veterinaria*[23] (Buenos Ayres). It contains a bibliography which is so complete that we have taken the liberty of transcribing it (*see below*, p. 252).

HATA[3] publishes the results which have so far been obtained in Japan by the method of UMENO & DOI. This consists in the administration of a single treatment of vaccine prepared as follows:—One part of fixed-virus brain is mixed with five parts of a solution consisting of sixty parts of glycerine and forty parts of 1·25 per cent. phenol in physiological saline. After thorough intermixture the emulsion is filtered, and kept in a thermostat at 20°C. for two weeks (during which time the vaccine looses virulence). The resulting vaccine kills rabbits, but does not convey infection to dogs, though in the latter a considerable degree of immunity is achieved. Two doses of 3 cc. each are administered, one on the chest and the other in the back.

The results in Tokio and Yokohama were as follows. Treatment was commenced in these two areas in 1919 and 1918 respectively:—

TOKIO.

	Number of dogs treated.	Number developing rabies within a year.	Number of uninoculated dogs which developed rabies.
1916 ..	—	—	428
1917 ..	—	—	456
1918 ..	—	—	511
*1919 ..	15,552	2	464
1920 ..	14,635	0	265
1921 ..	24,085	24	382
1922 ..	19,826	5	212

YOKOHAMA.

1916 ..	—	—	131
1917 ..	—	—	149
†1918 ..	6,644	0	213
1919 ..	9,150	0	44
1920 ..	2,927	1	43
1921 ..	10,951	0	62
	387‡	9‡	—
1922 ..	410	0	14

* Treatment commenced.
The total number of dogs was estimated to be about 30,000.
† Treatment commenced.
Total number of dogs about 15,000.
‡ These were treated with a vaccine which had not been properly attenuated. The nine dogs died immediately from its effects.

A further table shows that in Japan generally there had been no similar decline in rabies.

It would appear then that this method of control had been successful in Japan.

23 REVISTA DE MEDICINA VETERINARIA. Buenos Aires. 1924. June–July. Vol. 7. No. 2. pp. 82–87. (14 refs.).—El tratamiento de la rabia en los animales. La vacunación antirrábica preventiva de los perros. (Revista sintética.)

CORWIN[4], and BIGELOW & WEBBER[5] strongly recommend the same method—out of 1,600 dogs inoculated by the former in Connecticut, six were subsequently bitten by rabid dogs, None of these developed rabies. In particular a certain rabid dog bit two unvaccinated dogs and one which had been vaccinated; the two former died, the latter escaped.

MARTI[6] relates experience and further statistics from Barcelona, from the United States, and from Baden-Baden.

BIGELOW & WEBBER[5] inform us that in the municipalities of Englewood and Orange, in the State of New Jersey, legislative action in this direction has been taken.

Whilst, of course, such statistics as are available are insufficient to prove in a rigorous manner the efficacy of the treatment, it is clear that there is much to be said in favour of the introduction of this method of control into areas in which it is possible to deal with a significant proportion of the canine population. Apart from all other reasons, there always remains in the background the fact that any method of administration which rouses a community out of the prevailing apathy with regard to rabies will ultimately have the effect of reducing the prevalence of the scourge. In the words of JEUNHOMME[7], it is the bounden duty of everyone who lives in an area in which rabies is epidemic "conspirer sans cesse contra la liberté du chien." This does not apply to the British Isles, where quarantine is completely effective. The reviewer is not sufficiently acquainted with the conditions which prevail in the islands of Japan to say whether these should also be excepted.

Statistics of Treatment.—The Paris figures[24] for the last two years show a zero mortality amongst 754 and 727 cases treated.

SCHWEINBURG[25] deals with the statistics of the Vienna Institute for the last 25 years. The total mortality amongst 12,056 persons who received full treatment was 1·23 per cent. The failure rate was 0·8 per cent. He claims that as a result of the treatment there has been a reduction to at least one fifth of those who would otherwise have succumbed. The method of treatment employed for the majority of cases was that of dried cords given over a period of fourteen days, and commencing with 5 day dried cord. Since 1921 the Ether method of REMLINGER & ALIVISATOS has been employed for severely bitten persons. This has in his opinion lowered the failure rate. Prior to 1921 it was about 0·68 per cent.—whilst in 1921 it was 0·4, in 1922 it was 0·3 and in 1923 it was 0·24 per cent. He points out that the latter two percentages are due to five deaths which occurred amongst the lightly bitten who had not been treated by the ether vaccine.

ABEN-ATHAR[26] gives statistics from the Institute at Para in which dried medullas are employed. The course lasts from 18 to 21 days,

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24 VIALA (Jules). Les vaccinations antirabiques à l'Institut Pasteur en 1923.—*Ann. Inst. Pasteur.* 1924. July. Vol. 38. No. 7. pp. 648–650.

25 SCHWEINBURG (Fritz). Bericht ueber die Tätigkeit der Schutzimpfungsanstalt gegen Wut in den ersten 25 Jahren ihres Bestandes nebst Bemerkungen ueber Methodik und Erfolge der Schutzimpfung.—*Seuchenbekämpfung.* Vienna. 1924. Vol. 1. No. 5–6. pp. 135–147.

26 ABEN-ATHAR (Jayme Jacintho). Vaccinação anti-rabica. Accidentes e mortalidade.—*Sciencia Med.* 1924. Sept. 30. Vol. 2. No. 9. pp. 445–451.

Before 1920 periods of drying were from 10 to 2 days ; since that date they have been from 6 to 1 day. The results were as follows :—

	Treated.	Deaths.	Total mortality rate.	Failure rate.
1917 ..	71	2	2·81%	0%
1918 ..	168	1	—	·59%
1919 ..	273	4	1·46%	·73%
1920 ..	198	0	0	0
1921 ..	171	0	0	0
1922 ..	345	0	0	0
1923 ..	228	0	0	0

Methods of treatment.—KIRSCHNER[27,28], in a communication dealing with the effects of freezing and drying upon micro-organisms in general, devotes a portion of his paper to the case of rabies virus. He finds that dried virus which has previously been frozen retains its virulence for a much longer period than virus which has been exsiccated at ordinary temperatures. This he claims to be due to depression of physiological function at low temperatures, such that vital processes are suspended and that the plasma passes into a stable condition.

MORISON[29] has administered intravenous injections of SEMPLE'S vaccine to 169 severely bitten persons. This method of treatment is used as a preface to ordinary subcutaneous inoculation, and three to seven doses have been given in each case intravenously. Two hundred and twenty doses varying in volume up to 5 cc., and introduced at the rate of half a cc. per minute, have been administered with no ill effects. Amongst 96 persons to whom 5 to 7 such doses have been administered no failures have occurred. The vaccine is carefully filtered.

Paralytic accidents.—KRAUS[30] examines the prevalence of paralytic accidents after various methods of treatment, and finds that these occur much less frequently after treatment by HÖGYES' dilution method, and by dried cords method in which a relatively small quantity of nerve-substance is introduced. SCHWEINBURG[31] continues this examination from the experimental point of view. He was able to produce the condition by the inoculation of normal nerve-substance. Amongst 62 rabbits treated with this material according to the original scheme of the dried cord method 13 (20·9 per cent.) became paralysed. Of 8 rabbits treated according to the BABES-PISCARIU modification, 2 (25 per cent.) were affected. Whereas amongst 56 rabbits treated according to the HÖGYES' scheme no accident occurred. Thus he

27 KIRSCHNER (L.). Preservation of Stock Cultures of Bacteria and of Rabies-fixed Virus.—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 701–709. With 1 text fig.

28 KIRSCHNER (L.). Lasting Conservation of Bacteria and of Fixed Rabies-Virus.—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1924. Part III. pp. 294–301. With 1 plate and 1 text fig. Same paper as 27.

29 MORISON (J.). Intravenous Administration of Antirabic Vaccine.—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 333–334.

30 KRAUS (R.). Ueber die Ursachen der Schädigungen nach Schutzimpfung gegen Hundswut.—*Wien. Klin. Woch.* 1924. July 3. Vol. 37. No. 27. pp. 661–664. (24 refs.)

31 SCHWEINBURG (Fritz). Klinische und experimentelle Beobachtungen ueber Lähmungen nach Wutschutzimpfung.—*Wien. Klin. Woch.* 1924. Aug. 14. Vol. 37. No. 33. pp. 797–801.

concludes the paralysis is related to the quantity of nerve-substance employed. He therefore advocates the adoption of treatment by HÖGYES' method. This is an old story, a similar conclusion was arrived at by HARVEY & MCKENDRICK in 1908. (*Scien. Mem. Govt. of India*, No. 30, p. 30). Still, its reiteration seems to be very necessary. It is curious, however, that no mention is made of treatment by the safer methods in which carbolized virus in its various forms is employed. The attitude of FERMI in the brochure[10] to which we have already referred seemed at first to the reviewer to savour of propagandism, and to be unnecessarily combative. It would appear from the foregoing that this aggressiveness may really be a form of righteous indignation. KRAUS, as a result of his conclusions, pleads for the establishment of a conference to go into the whole matter of antirabic treatment. We are cordially in agreement with him.

Miscellaneous.—TSCHEKANOWSKY & SCHABUROW[32] have prepared an antiserum and are using it therapeutically on men and animals. May they have more success than their predecessors have had!

PUNTONI[33], in discussing the question of autovaccination, that is to say treatment by a vaccine prepared from the brain of the biting animal itself, claims that this method (which is really an autogenous treatment) is superior to treatment by ordinary fixed virus. Of 37 animals which had been immunized by an autovaccine, 21 contracted rabies (56·8 per cent.) when tested with street virus, whilst of 32 immunized by ordinary fixed virus, 23 died of the disease (71·9 per cent.).

ROSSI[34] contributes an article on myosis and midriasis in rabid dogs.

A. G. McKendrick.

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32 TSCHEKANOWSKY & SCHABUROW. Versuch zwecks Gewinnung antirhabischen Serums.—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian. pp. 137–139. German summary. pp. 216–217.

33 PUNTONI (Vittorio). L'autovaccinazione antirabica (con rilievi intorno ad alcune critiche del Prof. Fermi.).—*Clinica Vet.* 1924. Aug. Vol. 47. No. 8. pp. 445–451. (8 refs.)

34 ROSSI (Luigi). Miosi e midriasi nei cani affetti da rabbia. Lezione clinica.—*Clinica Vet.* 1924. Aug. Vol. 47. No. 8. pp. 451–457.

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See also UMENO (S.) & DOI (Y.). **A Study on the Anti-rabic Inoculation of Dogs and the Results of its Practical Application.**—*Kitasato Arch. Experim. Med.* 1921. Mar. Vol. 4. No. 2. pp. 89–108.

And references (3, 4, 5 and 6) in the foregoing review.

REVIEWS AND NOTICES.

VALASSOPOULO (A.) & PÉTRIDIS (Pavlos). With Preface by RIST (E.). **Les hépatites dysentériques et leur traitement.**—pp. viii+150. With 6 figs. 1924. Paris: Masson et Cie, 120, Boulevard Saint-Germain. [Price 12 francs.]

The first part of this work deals with the medical treatment of dysenteric hepatitis, and the second with the surgical treatment of tropical abscess of the liver. The authors are members of the staff of the Greek Hospital, Alexandria. After a few words of introduction and a brief historical prologue, Dr. Valassopoulo proceeds to define dysenteric hepatitis as a specific affection of the liver consecutive to amoebic dysentery and produced by the *Entamoeba histolytica* in habitual association with the microbes of suppuration, the bacteria being conveyed to the liver by the amoebae. He is manifestly sceptical as to the sterility of amoebic abscesses, and records that out of fourteen cases the pus from which was examined in his hospital laboratory, in only one was it found to be sterile, and in that two co-existing non-sterile abscesses were subsequently discovered. He quotes KRUSE & PASQUALE to the effect that large quantities of pus should be examined in these cases, the pyogenic organisms being present only in small numbers, and mentions that GAUDUCHEAU has found in such material a minute streptococcus culture of which, on ordinary media, would be hardly visible.

The author notes that abscesses have been discovered in cirrhotic livers, but finds ROGERS' theory of chronic cirrhotic changes consequent upon amoebiasis difficult to accept. In describing the symptoms pointing to abscess formation, a persistent hypo-eosinophilia is mentioned as a bad prognostic sign. A reference is made to amoebic cholecystitis the pathogeny of which is explained.

The chapter on diagnosis is a good one, Confusion between dysenteric hepatitis and malarial enlargement of the liver is said to be frequent in Egypt. The importance in some cases of anti-syphilitic treatment is emphasized, whilst the value of the emetine test and of radiography is fully recognized. The views of ROGERS on the degree and nature of the leucocytosis pointing to multiple abscess are quoted with approval.

Enthusiastic on the subject of emetine, Dr. Valassopoulo urges the necessity of successive courses of treatment, and the advisability of subsequently keeping the patient under observation. He testifies to the fact that abortive treatment by emetine has served to clear up innumerable cases of hepatitis progressing towards suppuration, and even to cure recent abscesses verified by puncture without recourse to further surgical intervention, but in regard to chronic cases expresses the opinion, unsupported, however, by any data, that combined treatment by emetine and aspiration will not suffice. He then discusses the types of case, mainly those of long standing abscess or of extreme physical debility, to which emetine treatment is not in the first instance applicable, and records the fact that in the hundreds of cases in which he has administered the drug he has encountered no serious accidents.

More than half of the surgical portion of the book, by Dr. Pavlos Pétridis, is devoted to interesting records of cases, some recent and some of ancient date, illustrating vividly the difficulties frequently experienced in differential diagnosis and sometimes in locating the seat of the abscess even after open operation. The author demonstrates that exploratory puncture cannot always be relied on to furnish proof of the non-existence of an abscess, and he moreover regards blind puncture of the liver as a procedure by no means free from danger, *e.g.*, from haemorrhage. With the object of avoiding these dangers, and securing free access to both surfaces of the

organ, the author's father, Dr. Aristide Pétridis introduced more than twenty years ago an operation of trans-pleural laparotomy designated by the unwieldy name of "Polypleurodiaphragmatotomy." For the different steps of this procedure, which, though apparently formidable, presents no real difficulties to the surgeon, the reader is referred to some excellent illustrations in the original. The operation is said to be equally applicable to either right or left side. The author recommends it for all cases where exploration through the thorax is indicated. When the abscess is thought to be situated in the anterior part of the liver corresponding to the epigastric region he practises an incision in the shape of an inverted V, the summit corresponding to the Xiphoid cartilage, and the lateral branches to the respective costal margins.

Dr. Pétridis makes no direct reference to the combined method of treatment by emetine and aspiration, in spite of the statement of his medical colleague referred to above. His objections to blind puncture perhaps suffice in his own mind to condemn a very distinct advance in treatment practised with extraordinary success by many observers, and in their opinion applicable to a great majority of cases. The work closes with an excellent chapter on migrations of liver pus into super- and sub-diaphragmatic regions.

J. J. Pratt.

LACAPÈRE, with the collaboration of LAURENT (Ch.). **Le traitement de la syphilis par les composés arsenicaux et les préparations bismuthiques avec l'exposé des nouvelles méthodes de laboratoire.** 4th Edition. pp. vii + 341. With 14 figs. 1925. Paris: Masson et Cie, 120 Boulevard Saint-Germain. [Price 16 fr.]

The first four chapters of this work are devoted to a review of the various preparations of mercury, arsenic and bismuth used in the treatment of syphilis, with a discussion as to the efficacy of each preparation, the indications and contra-indications in their use and details of dosage, mode of employment, etc. The dissertation on the use of bismuth salts is particularly interesting wherein the author deals fully with the constitution of the various bismuth preparations, their rate of absorption and elimination and the *raison d'être* of the method of their employment. The number of bismuth compounds on the market is very large already and continues to increase and it is essential that the practitioner shall know what he is using and why he is using it. Too often the treatment of syphilis has been stereotyped, whereas in reality it is necessary to study each individual case in devising (and revising) the appropriate treatment. This volume gives in easily accessible form all the requisite information towards this end. In chapter V are discussed the principles guiding the method of associating the various drugs in treatment, while in chapter VI the "incidents and accidents" attending treatment are very clearly set forth. The last chapter in Part I of the book consisting of 68 pages devoted to laboratory methods for the diagnosis of syphilis contains nothing new.

In Part II the author discusses treatment from the point of view of the disease in its various manifestations including a chapter on prophylaxis and anticipatory treatment. All the reasoning is sound and clear and agrees in general with principles laid down by authorities in this country.

There is no index, but the subject-matter is so arranged that the Table of Contents gives immediate reference to any point. The subject is presented in a clear and straightforward way, which will be appreciated by the English reader, for whom many books by French authors possess a quality which distracts the attention.

Hugh S. Stannus.

DELAMARE (G.). **Spirochétoses respiratoires stomatogènes.**—143 pp. With 14 figs. 1924. Paris: Masson et Cie, 120, Boulevard Saint-Germain.

In this monograph, Professor Delamare of the Faculty of Medicine in Constantinople, has attempted to bring together all the facts relating to the group of spirochaetes which have been found associated with affections of the respiratory tract. This association, in spite of an ever increasing array of clinical observations, remains little more than a clinical observation, and the author has done well in pointing out the defects in our knowledge of the subject and the danger accruing with the habit of labelling spirochaetes, discovered in some small number of clinical cases, with a definite specific name, thus creating a number of disease entities which do not rest on a sound basis. The variety in morphological and other characteristics of these organisms in any single case is such as to suggest a warning against attempting to deal with the subject in water-tight compartments, while the underlying pathology is uncertain and experimental research almost entirely barren of results.

Professor Delamare considers that a re-opening of the whole subject is necessary. For him, all the various types of spirochaetes which have been described as occurring in the respiratory tract are varieties of VINCENT's organism. He goes further and believes that the similar organisms found in the bowel (*S. eurygyrata*) are merely colon varieties of *S. vincenti*. He finds no evidence in favour of believing that there is a specific respiratory spirochaete of tropical countries, as described by CASTELLANI, and relegates this disease to the position of a syndrome, expelling *S. bronchialis* from medical nomenclature. He shows that cases of bronchial spirochaetosis have now been found scattered all over the world; that the disease is cosmopolitan, occurs in all latitudes, on the seaboard and inland and in all races. He believes, and brings evidence to show, that the chief etiological factor acting as a predisposing cause is a suitable "terrain"—the body must provide a suitable soil—this being determined by general debilitating influences and influences acting locally upon some system of the body. Thus he explains the occurrence of these infections in natives of the tropics as seen by CASTELLANI and others, in persons suffering from the many debilitating diseases, poor conditions of feeding, etc., of these countries. He shows that the number of cases recorded rose rapidly in 1918 at the time of the influenza pandemic, and refers to the fact that spirochaetes have beeen found by some observers in the sputa of 3 per cent. cases of pulmonary tuberculosis, and are associated with paragonimiasis, also to the association, on the other hand, of bowel spirochaetes with amoebiasis.

Speaking of the diversity of the lesions produced and the unity of the etiological cause, Professor Delamare says: "Regarding *S. vincenti* it attacks equally the bronchi or alveoli, and there, as elsewhere, gives rise to simple erosions, ulcerations, larger or smaller areas of necrosis or haemorrhages. Though giving rise alternatively to a haemorrhagic bronchitis, a fetid bronchitis or pulmonary gangrene, an ulcerating balanitis or hospital gangrene, a catarrhal or ulcerative enteritis, the organism *S. vincenti* remains identical, while it is the local flora and other local conditions which vary" and give rise to the varied clinical picture. In all these cases the author sees the results of an occasional pathogenicity on the part of a saprophytic mouth spirochaete. He would include them all under the term Fusospirochètose cosmopolite. Reference is made to the lacunae in our knowledge of the relationship of the spirochete and the fusiform bacillus and of the reason of this association or non-association in various cases.

In a long chapter on symptomatology reference is made to the numerous types of spirochaetal infections of the respiratory tract under bronchitis, acute, subacute and chronic, and a special type marked by extreme cachexia; latent forms and "formes frustes"; types characterized by

sputa, muco-purulent, bloody or fetid; forms with symptoms and signs of rhinitis (rare), laryngitis (serious), pulmonary congestion, consolidation, broncho-pneumonic patches, gangrene, or secondary infection of the pleura.

The author mentions that no attempt has been made to show the presence of a haemolysin or spirochaetolysin in the serum of patients, nor has any cutireaction been devised, also that pulmonary osteo-arthropathies never occur in this infection. The treatment advocated depends upon the association with other diseases; with bronchomycosis lipiiodol intravenously: with paragonimiasis antimony; with amoebiasis emetine; in cases of gangrene novarsenobenzol; and would give a trial to the last-named drug in most other cases.

Hugh S. Stannus.

ROGERS (Leonard) [C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S., I.M.S. (retd.), Physician and Lecturer, London School of Tropical Medicine; late Professor of Pathology, Calcutta Medical College.] & MUIR (Ernest) [M.D., F.R.C.S. Edin., Research Worker in Leprosy at the School of Tropical Medicine and Hygiene, Calcutta.] **Leprosy. Including in Amplified Form the First Three Croonian Lectures for 1924 delivered before the Royal College of Physicians of London by the First-named Author.**—pp. xii+301. With 65 figs. (including 32 plates & 1 map). 1925. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. [Price 12s. 6d. cloth covers & 10s. 6d. paper covers.]

This book appears very opportunely at a time when much public interest has been aroused in the miserable condition of the sufferers from this terrible disease, and when modern improvements in diagnosis and treatment justify a more optimistic view of their prospects in the future.

In Europe the number of lepers has steadily declined with the progress of general hygiene and sanitation, but in many other parts of the world the disease still persists on a large scale. According to the official census of 1920, there were over 100,000 known lepers in India; in tropical Africa, the authors consider that the total number "cannot well be less than 500,000, and may easily amount to double that number" if early cases are included. The authors give geographical estimates of numbers, but such estimates are of value only for purposes of comparison. In many instances the data are extremely meagre, and even where official statistics are available, these can represent only the fairly advanced and easily recognizable cases. In most Oriental countries, too, the statistics relating to the adult female population are notoriously inaccurate. Since the onset of leprosy is usually so very insidious, it is certain that very many lepers escape enumeration. It is, indeed, the difficulty of early diagnosis that constitutes the most serious aspect of the leprosy problem. Even the medical practitioner in tropical countries (and it is in hot damp climates that the disease is most prevalent) does not usually see cases in the very early stages. Owing to ignorance, and perhaps more often to a natural dread that their own suspicions may be confirmed, patients with early lesions are reluctant to seek advice; more often it is only when the condition is unmistakable that they present themselves for treatment.

It is to be hoped that, as lepers become aware of the favourable results of modern treatment, they will avail themselves in increasing numbers of the greatly improved prospect of recovery that lies before them. But since, even under the most favourable conditions of early diagnosis and skilful treatment, so much depends upon the intelligence, patience, and willing co-operation of the leper, a very notable diminution in the number of lepers throughout the world can scarcely be anticipated in the immediate future.

Sir Leonard Rogers has given an interesting, though rather brief, sketch

of the history of leprosy. He quotes many cases which appear to afford conclusive proof of the communicability of the disease through prolonged and close contact with lepers. There appears to be no reliable evidence incriminating biting insects, but the house-fly may possibly play some part in the spread of the disease. There are two valuable chapters on prophylaxis. The authors describe what they consider to be the ideal methods, and then discuss how these may require modification in different countries, according to the various hygienic, educational, financial, political and other conditions. In the clinical section, the descriptions of the different types of leprosy, and of the lesions caused by it, are realistic and graphic. In the chapter on diagnosis stress is naturally laid upon the great importance of early recognition of the disease, and the procedure to be followed is carefully described.

Probably most readers will turn with the greatest interest to the section on treatment. It is a difficult matter to appraise the value of any particular line of treatment. The disease is usually of very long duration, its lesions develop slowly, and spontaneous arrest, or even an apparent cure, is not at all uncommon; hence great caution is necessary in drawing conclusions as to the efficacy of any remedy. Moreover, there is no doubt that many febrile reactions, irrespective of their cause, are followed by at least temporary improvement. One cannot wonder that in such an apparently hopeless malady recourse has been had to many very different forms of treatment; and, for almost all of them, some favourable evidence, more or less convincing, may be found. DEYCKE's Nastin and ROST's Leprolin are examples of remedies, the early reputation of which has not been confirmed by time. Amidst all the vicissitudes of therapeutic fashions, chaulmoogra and hydnocarpus oils have been recognized as valuable in the treatment of leprosy for very many years. To Sir Leonard Rogers is due the great credit of devising preparations of the essential constituents of these oils, which, compared with the crude preparations previously used, are both more efficacious in their action and far less painful and irritating in administration. Detailed accounts are given of the methods of preparation, of injection, and dosage of the esters of chaulmoogra and other oils, and there are striking photographs illustrating their beneficial effects. There is an interesting section on the nature of the action on leprosy of these preparations. The authors are of opinion that, besides the benefit derived from the local reaction produced by injection of these irritants, there is a definite specific action upon the bacilli. There will be general approval of the recommendation here made of a combination of therapeutic agents, including injection of chaulmoogra and other oils, local applications to destroy leprous nodules and patches, potassium iodide for its "sensitizing" effect, with tonics, exercise, and close attention to general hygienic conditions.

There remains the all-important question; what are the prospects of a real cure for the leper? This is answered by the authors as follows: "In the third stage of the disease, provided exciting causes can be removed, the hope of a steadily diminishing infection can, as a rule, be held out to the patient, the duration of the disease being largely determined by the grossness of the infection, the severity of the treatment which the patient is subjected to or is able to bear, the state of his general health, and his activity in his habits. In the first and second stages . . . there is . . . some degree of uncertainty whether, even under the best available treatment, the disease can be arrested without passing through the third stage . . . When a patient has lost all active signs of the disease without passing through the third stage, becomes bacteriologically negative after all signs of nerve lesions [have disappeared], except such as may be due to permanent destruction of nerve-fibres or sensory end-organs, and shows no signs of new lesions for two years, he may be said to be relatively cured. The term *absolute* cure should be reserved for those who have passed through the third stage, and have a high degree of immunity. It will be realised that without this immunity in a disease in which the germs can lie latent for over twenty

years, it is impossible to prophesy that circumstances will not occur in which some few lepra bacilli, still hiding among the tissues of the body, will again produce the disease in a patient who formerly suffered, and is now apparently cured." No one with any experience of leprosy will be inclined to cavil at the admirable restraint and moderation of this statement.

The authors are to be warmly congratulated on the production of this work, so free from bias, so expressive of a very close study and intimate acquaintance with the disease, and so full of original observations, reasoned conclusions, and practical advice. It cannot fail to promote a more general interest in, and sympathy with, the very numerous sufferers from this depressing scourge of humanity, and it will surely lead to an alleviation of their unhappy lot. The volume is well produced, and is illustrated by more than sixty excellent diagrams and photographs.

H. J. Walton.